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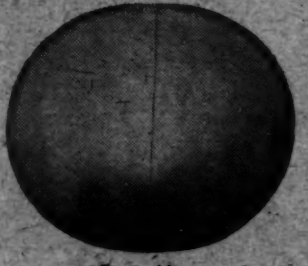

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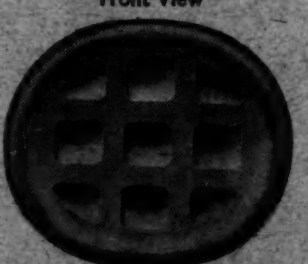

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 26 1952

THE SURGICAL TREATMENT OF CHRONIC ULCERATIVE COLITIS*

BY

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Chronic ulcerative colitis is an important and serious disease, not only because of its obscure aetiology, but because of its variable response to treatment, its liability to relapse, and its serious economic effects—the chronic invalidism, the loss of working time, and much hospitalization that often result.

There is a general impression, I believe, that ulcerative colitis has become more common in this country in recent years; no doubt a steady increase has taken place, particularly in the past five years, in the number of cases referred for consultation and surgical treatment. When on a visit to Spain recently, I was interested to learn that it is extremely rare in that country. Why this should be so I do not know, since in the great cities like Madrid and Barcelona the pressure of life seemed to be as great and the hours kept by most people were appreciably longer than here.

In recent years much interest has been taken in the possibility of curing this disease by colectomy, and many important papers have appeared from clinics on both sides of the Atlantic. It is generally agreed that 15 to 20% of cases advance to the stage where surgery becomes necessary. For instance, Bacon and Trimpi (1950), in a series of 249 cases, operated on 45 (18%), Garnet Ault (1949) operated on 23 patients out of 120 (19%), and Cattell and Sachs (1948), in a group of 630 patients, operated on 166 (26%).

One of the chief problems is to decide when purely medical treatment should be terminated and surgery instituted, and in each case this is a matter for careful consideration between physician and surgeon. All observers agree that the moment for surgical assistance should not be left too late: the "last ditch" ileostomy carries a far higher mortality than the operation which is done in good time.

Indications for Surgical Treatment

Failure of Medical Treatment.—This phrase does not imply the total failure of medical treatment, since almost all patients will *for a time* respond in varying degree to rest in bed, good nursing, and one or other of the varied medical measures which are available, especially blood transfusion. Failure is more often seen in persistent relapse in spite of repeated courses of treatment. When we see a patient who has been in and out of hospital for nine or ten years with ulcerative colitis we may be sure that the stage has been reached when surgical intervention must be urgently considered, and in such cases this decision will surely be supported both clinically and radiographically.

Evidence of Pseudo-polyposis.—This is without doubt the most important—in fact, the absolute—indication for major surgery. The evidence may be as follows: (1) *Clinical indications:* If digital examination of the rectum reveals small firm rounded nodules or irregularities in the rectal wall they are almost certainly present higher up too, and sigmoidoscopy will confirm this; if pseudo-polyposis is present in the rectum and recto-sigmoid we can say without hesitation that ileostomy and total colectomy are necessary. The differential diagnosis between true polyposis intestinalis and the pseudo-polyposis of chronic ulcerative colitis is quite easy. In polyposis intestinalis the sigmoidoscope shows multiple bright-pink polypi of varying sizes set on a normal pale mucosa with a normal lumen and probably normal stools, and no free blood or mucus or pus. In ulcerative colitis, however, there is a *contracted lumen* with mucopus and perhaps free blood in the lumen; no normal mucous membrane will be seen, but instead a highly hyperaemic background which may be obviously ulcerated or covered with sloughs, mucopus, or debris, with granulomata peering through. (2) *Radiological evidence:* This is obtained by a barium enema examination. No special technique is required, and as a rule air inflation is neither necessary nor advisable, since many areas may be thinned, fibrotic, and unused to air distension, and no one would care to court a disaster from the *x*-ray department. The least suggestion of mottling, whether fairly generalized throughout the colon or limited to one or more areas, can be taken as certain evidence of pseudo-polyposis.

The need for regular radiographic control in these cases is shown by Fig. 1: the interval between these two examinations was five and a half years, and when the patient was finally admitted to hospital, as soon as possible after the last *x*-ray film, she was moribund, dying a few hours later. The alarming speed at which the condition of the colon can deteriorate is shown in Figs. 2 and 3. Fig. 2 shows the appearance of the colon in August, 1949, in a long-standing case of ulcerative colitis previously treated (1938) by appendicostomy; three months later (November, 1949) her general condition had deteriorated suddenly and a fresh *x*-ray film showed clear evidence of pseudo-polyposis and stricture

* An address given to the Middlesex Hospital Medical Society on January 29.

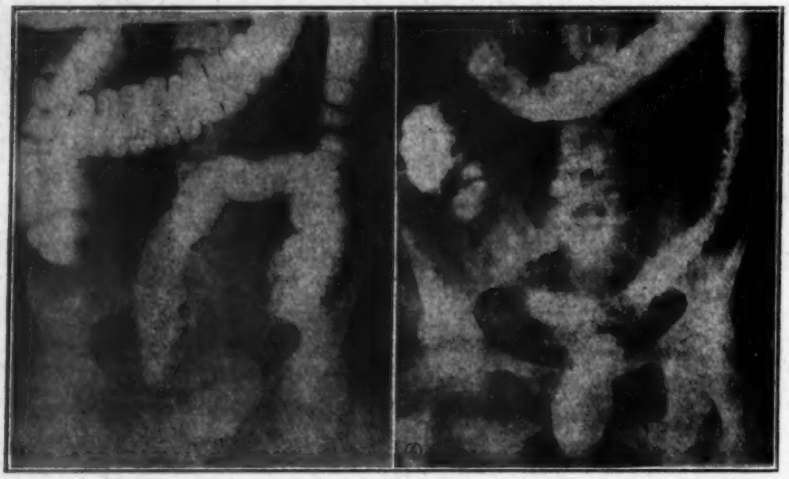

FIG. 1.—*X*-ray films of case of ulcerative colitis. (A) July, 1943, at which stage patient had a mild granular proctocolitis. (B) January, 1949; patient extremely ill and very anaemic Film shows a severe ulcerative colitis with pseudo-polyposis. Patient was moribund when admitted into hospital, and the post-mortem examination showed perforation of the colon and peritonitis.

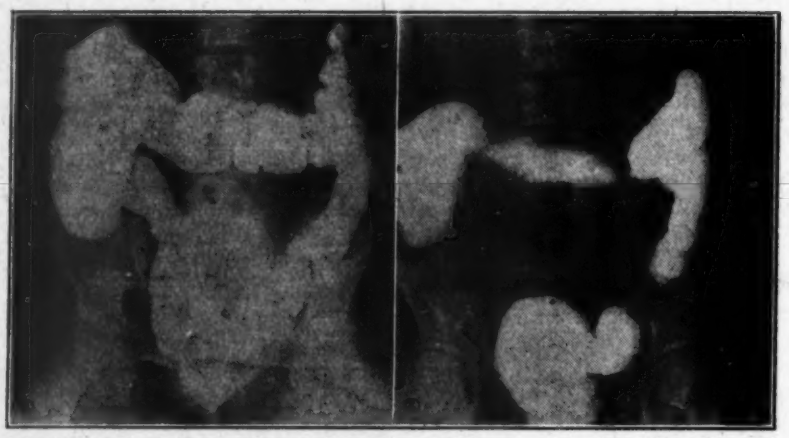

FIG. 2.—Barium enema films at intervals of three months. (A) Film taken of case of chronic ulcerative colitis 11 years after appendicectomy shows moderate haustration and no gross changes. (B) View three months later showing pseudo-polyposis and stricture formation in transverse colon, but operation revealed six separate carcinomas in the colon, with cirrhosis and secondary deposits in the liver: the largest growth was a high-grade anaplastic carcinoma in the recto-sigmoid region.

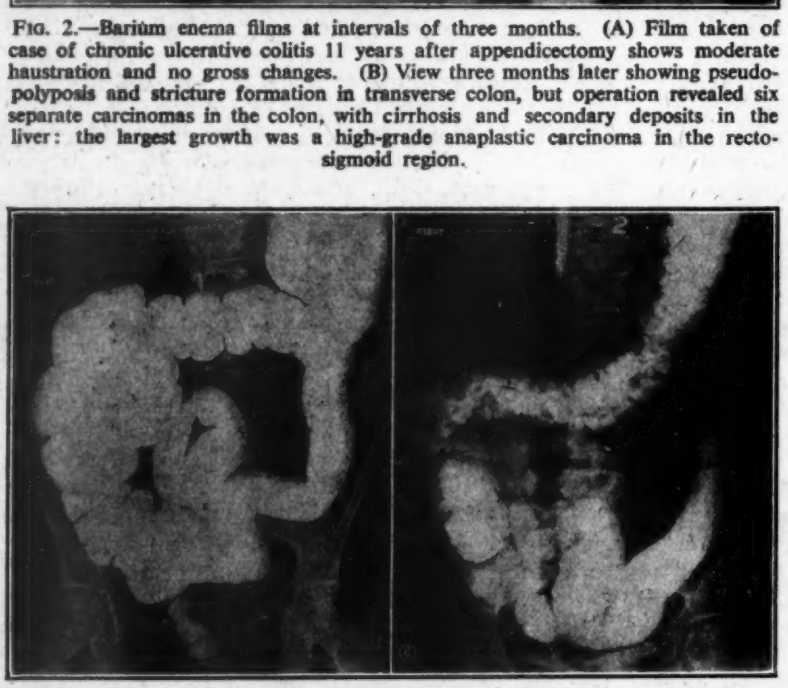

FIG. 3.—Barium enema films at intervals of three and half months; B shows advanced ulcerative colitis with pseudo-polyposis. Ileostomy and total colectomy were done in three stages; patient alive and well.

formation in the transverse colon. Ileostomy and subtotal colectomy were performed, but by this time her liver showed advanced cirrhosis, with secondary malignant deposits; the large intestine presented six separate adenocarcinomas. Five of these were in the specimen removed by subtotal colectomy, and the sixth, which was the largest, was a high-grade anaplastic carcinoma situated in the recto-sigmoid region, and was removed post mortem (she died on the sixteenth day after operation).

Another example of very rapid deterioration is seen in Fig. 3, the interval here being only three and a half months. In this case, however, the ileostomy and total colectomy were done in time, and the patient is now very well.

Relationship Between Ulcerative Colitis and Malignant Change

There is general agreement that the incidence of malignant change is fairly high in long-standing cases of chronic ulcerative colitis. Cattell and Sachs (1948) reported having had 12 patients in whom carcinoma had developed from ulcerative colitis—an incidence of 7% of the patients operated upon. Scarborough and Klein (1948) made a special study of the mucosal hyperplasia and pseudo-polyposis of chronic ulcerative colitis, and concluded that malignant degeneration was common enough to warrant classification of these changes as precancerous, seeing that 4 of their 15 cases of pseudo-polyposis developed carcinoma (27%), three of the four being inoperable.

In my series of 68 cases of chronic ulcerative colitis treated surgically in the past 10 years carcinoma developed in six instances, or 9%. The noticeable features were the insidious onset, the rapid progress of the disease, the high grade of malignancy, and the fact that in every case the colitis had been present for more than 10 years; in the six cases the duration of the disease had been 12, 13, 14 years (one each), 20 years in two cases, and in one for 38 years. This last patient was a man aged 60 at the time of his colectomy in April, 1950, and he is the only one who has survived. His growth was a diffuse one, involving about 6 in. (15 cm.) of the descending colon, and was suspected only at the time of operation by reason of the presence of slightly more thickening and induration in the wall of the colon than one usually finds in these cases.

Evidence of Fibrosis or Stricture Formation.—If a case of chronic ulcerative colitis is found to be developing a rectal stricture which can be felt with a finger or be seen through a sigmoidoscope, one may be sure that a similar process is occurring higher up in the colon. Radiographic evidence of stricture formation, usually in the transverse colon or down the left side of the colon, can easily be obtained. The strictures are fusiform, as opposed to the stricture with a sharp right-angle edge seen in malignant disease, and are often multiple. A general

narrowing with complete loss of haustration, constitutes the so-called "gas-pipe" colon, and is certain evidence of a late and irreversible stage of the disease.

Arthritis.—This is a fairly common complication of long-standing ulcerative colitis and may be seen in fingers, knees, hips, and spine. The development of multiple arthritis is in effect evidence that surgical treatment has been delayed too long, but there is the cheerful prospect that practically all cases will improve more or less after ileostomy and colectomy. For instance, one of my patients who at first was bedridden with severe flexion deformities of knees, hips, and fingers was ultimately able to get about quite nimbly after total colectomy, and later used only one stick. In another case the pain and swelling in one knee-joint disappeared two or three days after her subtotal colectomy.

Surgical Complications.—These may be *abdominal*—for instance, perforation of the colon with localized or generalized peritonitis, or subacute obstruction from one or multiple fusiform strictures in the colon. *Rectal complications,* such as intractable stricture or severe recurrent perirectal suppuration, are good indications for surgical intervention. *Spreading ulceration of the skin,* usually affecting the legs, has been described and illustrated by Butler (1948) and by Corbett (1952); this complication is not likely to respond to treatment except by ileostomy and colectomy.

Surgical Technique

As in other operations on the colon, the procedures have varied a great deal, but opinion is now crystallizing very definitely in favour of ileostomy and colectomy.

Although ileostomy alone gives dramatic relief in some severe cases, the disease is not cured; ulceration persists in varying degrees, severe haemorrhage may recur, and, above all, there is the risk that carcinoma may develop at one or more points in the colon. We can therefore take it that once an ileostomy is decided upon it should be regarded as a permanency, and it should be followed in most cases by a total colectomy.

The results in my series of 50 cases in which a three-stage procedure has been or is being carried out as described by Cattell and Sachs (1948), of Boston, show that the mortality of these operations is now very low. Although many of these cases were in a serious condition when surgery was first instituted, the progressive improvement in weight and well-being as the various stages were carried out has been remarkable. So far I have not seen any reason to risk a successful outcome by doing a major resection of the colon before a satisfactorily functioning ileostomy has been established and a noticeable improvement has become evident in the patient's general condition.

Ileostomy

This operation has been done in 50 cases. In my earlier cases it was either a loop type of ileostomy, fixed by a glass rod as for a colostomy, or a disconnected type of ileostomy in the right iliac fossa. I very quickly saw the disadvantages of these methods. The loop type of ileostomy exposes a large area of mucous membrane with much discharge, and it is difficult to fit with an appliance: the ileostomy with proximal and distal openings is equally difficult to manage, and when it comes to the point there is *no object whatsoever* in having a distal stoma. The colon in these cases requires only rest, and in several of my earlier cases whenever we tried to irrigate the colon with mercurochrome or saline lotion a sharp spike in the temperature resulted.

I have no hesitation in strongly recommending a terminal ileostomy, which is best made through a short right transrectus incision. The subsequent colectomy procedure is facilitated by applying the Parker–Kerr clamps *close to the caecum*—that is, about ¼ in. (1.9 cm.) proximal to the ileocaecal valve. The distal end is closed so that when the returning layer of the Mikulicz stitch is completed the closure is flush with the caecal wall, and if possible a tag of fat or a piece of the fatty meso-appendix is sewn over it; this manœuvre greatly helps the next operation, when the caecum has to be mobilized, and saves time and trouble in not having to mobilize an adherent ileal stump.

The proximal end of the ileum is mobilized sufficiently for it to be exteriorized comfortably (about 1½ in. (3.8 cm.) outside the abdominal wall), and care is taken not to close the abdominal parietes too firmly round the bowel or there will be trouble with constriction. In only one case have I had to resect about 12 in. (30 cm.) of the terminal ileum on account of apparent involvement as shown by thickening and hyperaemia.

The terminal ileostomy should be placed about ½–1 in. (1.3–2.5 cm.) below and to the right of the umbilicus and no lower. An ileostomy is much easier to manage in this position, whereas if it is placed lower down in the right iliac region it is a nuisance to the patient, since the ileostomy apparatus tends to ride up and become displaced, especially when the patient is sitting.

At the conclusion of the ileostomy operation dry dressing gauze is applied round the ileum and is kept in position by means of Michel clips. The ileum is decompressed by a small-bore Paul's tube, and this usually drains effectively for about six days, thus keeping the wound perfectly clean. As soon as the Paul's tube is removed steps are taken to prevent that common trouble with ileostomies—namely, stenosis—and the ward sister is asked to pass a finger into the ileostomy each day.

It is remarkable how slight is the disturbance produced, as a rule, by ileostomy, and only a few very ill patients require intravenous fluids. If any post-operative distension takes place it is most probably due to spasm in the terminal ileum, and the situation can be relieved by removing the Paul's tube and passing a soft rubber catheter into the ileum and leaving it in-dwelling for 12–24 hours: a large safety-pin put through its outer end prevents it slipping into the ileum.

My mortality in 50 cases of ileostomy is shown in Table I. The operative mortality is 6%—one of these cases having an advanced diffuse carcinoma of the pelvic colon. Three other patients died in hospital within three months—one from toxaemia and severe perirectal suppuration, one from peritonitis due to perforation of an ileal ulcer, and one from amyloid disease. Subtotal colectomy has been done in 32 cases (see Table II) and four recent cases are awaiting colectomy.

TABLE I.—*Results of Ileostomy (1941–51)*

Operative deaths (operative mortality 6%)	3	(2 fulminating disease, 1 inoperable carcinoma of pelvic colon)
Hospital deaths during 2nd and 3rd months after operation	3	(1 toxaemia, 1 amyloid disease, 1 perforation of ileum)
Recovered and relieved; no further operation	5	
Recovered but died later	3	(2 toxaemia (10 and 12 months), 1 carcinoma of colon or rectum (19 months).)
Recent cases waiting for colectomy	4	
Had subtotal colectomy later (see Table II)	32	
Total	50	

TABLE II.—*Chronic Ulcerative Colitis Treated by Subtotal Colectomy Following Ileostomy*

Operative deaths (operative mortality, 6·25%)	2		6th day, intestinal strangulation and mesenteric thrombosis 16th day, multiple carcinomas of colon with cirrhosis and secondaries in liver
Subsequent deaths	2		4 months, recurrent carcinoma of transverse colon 10 months, perforation of ileal ulcer
Recovered and later had perineo-abdominal excision of rectum (see Table III)	21	28	
Recovered and now awaiting excision of rectum	7		
Total	32		

Subtotal Colectomy

This operation can usually be done three to four weeks after the ileostomy, or it can be postponed according to the patient's general condition. If a complication such as arthritis or pseudo-polyposis is present the sooner colectomy can be carried out with reasonable safety the better.

With the ileostomy nicely established just to the right of the middle line both sides of the abdomen are available, and I make a practice of doing a colectomy through two incisions as follows:

(1) A relatively short curved right oblique incision enables the caecum, ascending colon, and right half of the transverse colon to be mobilized and the necessary vessels (ileo-colic and right colic) to be ligated and divided; the bowel is then pushed into the abdomen and the wound is closed, with stainless steel wire to the external oblique. In one recent case it proved possible to close the space to the right of the ileostomy by means of a running stitch before closing the right oblique incision, and this promises to give protection against internal strangulation here. This space has been referred to by Brooke (1951) as the "para-ileal gutter."

(2) A left paramedian incision gives good access to the rest of the colon, and a lateral-tilting table assists in mobilizing the splenic angle; at this stage it is usually a great help to grab the descending colon just *below* the splenic flexure and, after incising the peritoneum on its lateral aspect, to work up towards the splenic flexure rather than to proceed in a clockwise direction along the left half of the transverse colon. At any rate, when the splenic flexure has been reached and the long specimen of thickened diseased colon is lying on the patient's abdomen, we can feel that the operation is getting along nicely. At this stage I sometimes remark that we seem to have got round Tattenham Corner satisfactorily and are now going down the straight. The colon is mobilized down to the iliac portion, the left colic artery and perhaps the first sigmoid branch being ligated, and the entire specimen is then passed intact through a short left oblique incision, with closure of the lateral space. The left paramedian incision is closed without drainage after haemostasis is confirmed, and the emerging colon is divided in between de Martel clamps, leaving one clamp on the colon about 1 in. (2.5 cm.) outside the abdominal wall, and dry dressings are applied. A routine blood and glucose–saline drip is given after this for 24–48 hours, and usually the patients pick up very quickly. The mortality for this operation in my hands so far has been 6.25% (see Table II).

Total Colectomy

The final combined operation for removal of the remaining recto-colic segment is one which I usually postpone for three to six months after the subtotal colectomy. By this time the patient should have put on weight, and in fact this has sometimes been a cause of difficulty—so much so that in a few instances I have thought it advisable to recommend some weight reduction before the final operation.

A perineo-abdominal excision done blind from below proves ideal for these cases. The rectum is mobilized, the peritoneum is opened from below, and the rectum is then pushed up into the pelvis encased in a sterile rubber glove. The perineal wound is closed round a drainage tube, and the operation is quickly completed from the abdominal aspect through the lower part of the previous left paramedian incision. The old colostomy stoma by now often proves to have become completely healed over; it is dissected up and taken inwards, the inferior mesenteric vessels are ligated in the usual manner, and the specimen, consisting of the rectum and pelvic colon, is thus removed unopened. Care should be taken not to damage the ileostomy with retractors. The results of total colectomy are given in Table III.

TABLE III.—*Total Colectomy. Final Perineo-abdominal Excision of Remaining Recto-colic Segment for Cases of Chronic Ulcerative Colitis*

No. of cases	21
Plus disrupted Devine's operations—i.e., restoration of ileostomy and later excision of rectum	2

Operative mortality, nil. These patients are all alive and in good health.

Special Problems

There are one or two special problems which I should like to mention.

1. Patients are occasionally seen with severe chronic ulcerative colitis who minimize their symptoms, insisting that they are well, and whose general condition is reasonably well maintained in spite of radiological evidence that a typical fibrosing ulcerative colitis has developed. In such cases I am sure that it is wise not to press for immediate surgery, and I fully agree with Brooke (1951) regarding the importance of gaining the patient's confidence, getting him to realize that major surgery is necessary, and obtaining his acquiescence in the necessity for ileostomy life. In the type of case I have mentioned it is surely best for the patient to carry on with medical treatment and remain under close observation until some crisis or complication takes place which renders surgical measures acceptable.

2. Segmental colitis presents a difficult problem, especially when it involves the left side of the colon only, and even more so when the pelvic colon is chiefly affected. In these cases we must resist the temptation to do a colostomy proximally to the *apparent* area of disease. A colostomy is doomed to failure, because sooner or later the disease will surely spread upwards, and a patient with a colostomy in an area involved by colitis, especially if pseudo-polyposis develops in the exposed mucous membrane, as it is apt to do, is in a very unhappy situation; so also is the surgeon responsible. Attempts to close the colostomy usually fail owing to the breaking down of the wound, and the patient is left with a faecal fistula discharging blood, pus, and faeces, during which time the disease is gradually progressing. In such cases the correct treatment is, of course, an ileostomy followed by colectomy, and the part of the colon involved in the previous colostomy (whether transverse or iliac) is resected in the course of the colectomy. A caecostomy is equally ineffective for cure or relief of ulcerative colitis, and may prove to be a grievous burden to the patient.

3. Chronic ulcerative colitis is rarely seen with the rectum and recto-sigmoid apparently normal or almost normal; in the large series reported on by Kiefer and Jordan (1946) the rectum was free from disease in only 6% of cases. The sigmoidoscope may show an adequate lumen with only a very slight degree of friability of the mucosa, yet with radiological evidence of severe fibrosis and ulceration in the colon. In such cases the surgeon's thoughts naturally turn on the possibility of resecting the major portion of the colon and restoring continuity by an ileo-colic or ileo-rectal anastomosis. This can be done either by a suture anastomosis or by a crush anastomosis as advocated by Devine (Devine and Devine, 1948).

My experience of Devine's operation has been limited to six cases, all carefully chosen on account of apparent freedom from rectal ulceration. There was one operative death on the 18th day, probably from small-gut strangulation. Of the remaining five patients, who all recovered and in due course had their ileocolic anastomosis closed, four have had to be put back to a permanent ileostomy after an interval of one, one, two, and three years respectively: the indications for doing this were severe perianal and perirectal suppuration (two cases), recurrent severe rectal haemorrhage associated with attacks of internal strangulation (one case), and an acute flare-up of rectal ulceration (one case). Of these four cases two have had a perineo-abdominal excision of the remaining recto-colic segment successfully done, and the other two await their final operation.

Subtotal colectomy with a sutured anastomosis between the ileum and lower pelvic colon is an operation which I have done in three cases. There was one death, on the 11th day, probably

from internal strangulation, and the remaining two patients have remained well for approximately two years, although somewhat bothered by the need to have a bowel action three to four times daily.

Other Operations

One-Stage Ileostomy and Colectomy.—Subtotal colectomy and ileostomy in one stage has been recommended by Miller, Gardner, and Ripstein (1949), who have ably set out the arguments in favour of this procedure—namely, the immediate removal of the diseased bowel (which must act as a source of toxic absorption and contributes to blood and protein loss), the elimination of multiple-stage operations, and the absence of immediate mortality: in 24 cases there were no operative deaths, although two patients died subsequently, one from haemorrhage and one from infection from the remaining rectal segment. A one-stage colectomy and ileostomy has also been recommended by Dr. Henry Cave (1949), of New York, and by Bacon and Trimpi (1950), of Philadelphia. There seems to be general agreement that it is safer to bring out a distal colonic stoma than to attempt an intraperitoneal closure, and personally I favour a stoma in the left iliac region in order that the lateral space may be closed and a potential source of internal strangulation obviated, such as must be present if the colon is brought out through the lower end of the paramedian incision.

The merits of this one-stage procedure seem fairly obvious and will no doubt be settled in due course. I propose to start such a series immediately, especially in those cases with pseudo-polyposis and those with persistent blood loss which fails to be met by repeated transfusions. In such cases it would appear to be reasonable to remove the colon at the earliest possible date.

Vagotomy.—I have had no experience of vagotomy in ulcerative colitis, and cannot believe that this procedure will alter the course of the disease in the later stages which we are considering, when fibrosis and pseudo-polyposis have developed.

Ileo-anal anastomosis as proposed by Ravitch (1948) is another possible surgical procedure. It seems to me, however, to be a pity to risk giving a patient a troublesome anal ileostomy instead of a well-placed and easily managed abdominal ileostomy. The researches of my colleague Goligher (1951) on this matter are illuminating, and personally I have no intention of attempting this procedure. These colitis patients are, for the most part, nervous and sensitive people who have had much trouble in the past, and I think that if they submit to operation they should have a well-tried procedure and one which gives the greatest security—that is, total colectomy—with the minimum of risk not only in regard to the operation but in regard to the risk of setbacks and prolonged stay in hospital and possible disappointment.

Appendicostomy is now a discredited operation so far as cure is concerned, and the indications for its performance are very rare. Two of my old appendicostomy patients ultimately developed inoperable carcinoma of the colon after the lapse of 10½ and 12 years respectively. Two others have remained well for 18 and 22 years respectively, but in one of these there is now *x*-ray evidence of pseudo-polyposis in the iliac colon, and I think ileostomy and colectomy must be done fairly soon. The chief indication for appendicostomy in the present day is in those rare cases (1) when the physician considers that no further improvement can be got by medical treatment and the surgeon feels that the disease is not severe enough for an ileostomy—for instance, in cases of ulcerative proctitis; (2) when the patient is considered to be temperamentally unfitted for an ileostomy and colectomy; or (3) when an ileostomy is steadfastly refused. Under such conditions an appendicostomy may reasonably be undertaken as a minor temporizing operation which provides a means of introducing oils or emulsions into the caecum, as well as the best possible access for irrigating the large bowel and clearing it of pus and debris. An appendicostomy can be regarded as a half-way house—part way towards relief in the less severe cases, especially in refractory cases of ulcerative proctitis; or, if necessary, it provides a basis for proceeding to an ileostomy and colectomy later if indicated by general deterioration of the patient or extension of the disease as shown radiographically.

Summary

Of the many indications for surgery in chronic ulcerative colitis the most important are failure of medical treatment, *x*-ray or sigmoidoscopic evidence of pseudo-polyposis, and arthritis.

When fibrosis and pseudo-polyposis have developed, ileostomy and total colectomy give a good prospect of cure, provided that the radical operation is done *before* the onset of malignant disease.

In a series of 68 cases treated surgically during the past ten years, carcinoma is known to have developed in six cases, or 9%. The average duration of the disease in these cases was 19 years.

A three-stage operation for total colectomy is recommended, and the operative mortality for these three stages has been indicated in a personal series of 50 cases—namely, of 6% for ileostomy, 6.25% for subtotal colectomy, and none for the final recto-colic excision.

Little success can be reported with operations which have the object of preserving the rectal function, and my belief is that these operations, although perhaps temporarily successful, are apt to be followed at some future date by relapse and involvement of the remaining rectal segment.

REFERENCES

Ault, Garnet W. (1949). *Arch. Surg., Chicago*, **58**, 243.
Bacon, H. E., and Trimpi, H. D. (1950). *Surg. Gynec. Obstet.*, **91**, 409.
Brooke, B. N. (1951). *Ann. roy. Coll. Surg. Engl.*, **8**, 440.
Butler, E. C. B. (1948). *Proc. roy. Soc. Med.*, **41**, 474.
Cattell, R. B., and Sachs, E. (1948). *J. Amer. med. Ass.*, **137**, 929.
Cave, H. W. (1949). *Rev. Gastroent.*, **16**, 489.
Corbett, R. S. (1952). *Ann. roy. Coll. Surg. Engl.*, **10**, 21.
Devine, H., and Devine, J. (1948). *British Medical Journal*, **2**, 127.
Goligher, J. C. (1951). *Ann. roy. Coll. Surg. Engl.*, **8**, 421.
Kiefer, E. D., and Jordan, S. A. (1946). *Trans. Amer. proctol. Soc.*, p. 487.
Miller, G. G., Gardner, C. McG., and Ripstein, C. B. (1949). *J. Canad. med. Ass.*, **60**, 584.
Ravitch, M. M. (1948). *Surgery*, **24**, 170.
Scarborough, R. A., and Klein, R. R. (1948). *Amer. J. Surg.*, **76**, 723.

Employment of tuberculous patients is the subject of a Ministry of Health circular just issued to local health authorities. The Standing Tuberculosis Advisory Committee has stated that there need be nothing against placing these people in ordinary jobs provided there is medical approval of the suitability of the work. The Disabled Persons (Employment) Act enables the employment of infectious tuberculous patients to be medically controlled. It is preferable that jobs should be found for them in this way rather than that they should go into unsuitable ones and not say that they are tuberculous. Disablement resettlement officers are therefore encouraged to help these patients to find work. Their capacity must be assessed by a chest physician and reported to the D.R.O., who then knows the type of work to look for. Co-operation is required between the local medical officer of health, who is generally responsible for public health, the chest physician, with his first-hand knowledge of the patient, and if possible the patient's own doctor. Details of the necessary procedure are given. The D.R.O. must first submit the case to the medical officer together with the chest physician's report. When a decision has been reached the medical officer informs the resettlement officer. Should employers hesitate to take on a tuberculous patient the D.R.O. can of course ask the help of the medical officer and the chest physician, who can do much to remove prejudice or apprehension. Finally, when such a patient has been engaged medical supervision should be continued.

TREATMENT OF SEPTIC ABORTION

BY

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The correct management of patients suffering from septic abortion presents a gynaecological problem which still awaits an agreed solution; the main controversy lies between the interventionist school, who advise immediate evacuation of retained products of conception from the uterus in most cases, and the non-interventionists, who postpone operation until later in the course of the illness and avoid it altogether if they possibly can. Although this problem has been deprived of much of its urgency by the advent of powerful antibiotic drugs which produce good results when used in conjunction with either form of treatment, it is still desirable to determine which method will the better curtail the patient's illness, with the least possibility of subsequent ill-health and infertility. As a contribution towards this decision, the results of the treatment received by 267 consecutive cases of septic abortion admitted to the West Middlesex Hospital during the five years 1946–50, inclusive, have been analysed and are here presented for consideration.

Definition

The first difficulty which besets the investigator is the necessity of defining accurately what is meant by a septic abortion. For the results of different observers to be comparable a common standard is necessary; yet many writers on the subject, who show no hesitation in tendering categorical advice to their colleagues, never at any time define the entity about which they are prepared to dogmatize. Probably the best definition is "an abortion (the termination of pregnancy before the 28th week, the foetus not being born alive) in which infection of the genital tract with pathogenic organisms occurs at the time of induction, during the expulsive process, or later during the puerperium."

The diagnostic criteria by which such an infected abortion is recognized are:

1. A febrile reaction on the part of the patient following the induction, or during the abortion or puerperium, in which a temperature of 99° F. (37.2° C.) or over is maintained for 24 hours and is not accounted for by any extraneous lesion. A temperature which does not persist for this length of time should not, in the absence of other signs, be taken as evidence of a septic abortion, for an isolated spike of temperature often occurs in the complete absence of infection.

2. The signs and symptoms of intrauterine sepsis, such as an offensive lochial discharge or a subinvoluted tender uterus.

3. The signs and symptoms of extrauterine infection in a case of abortion, shown by tender adnexal swellings, consolidation of the parametria, or tenderness on palpating the pelvic peritoneum.

Table I shows that of a total of 2,322 abortions, comprising all cases of threatened, inevitable, complete, incomplete and missed abortion, admitted to hospital during this period, 267 (11.5%) were septic in character. This incidence is rather low, as Studdiford (1950) found 38% of 4,129 abortions occurring in New York over the nine-year period from 1940 to 1949 to be septic in nature, while Bishop (1948) reported 17.3% of 1,380 cases of abortion collected between 1942 and 1947 to be infected.

TABLE I.—*Incidence of Septic Abortions and Their Classification Into Anatomical and Clinical Types*

Total No. of abortions	2,322	
No. of septic abortions	267	11·5%
Type I cases	231	86·5%
" II "	29	10·9%
" III "	7	2·6%
Mild cases on admission	115	43·1%
Severe " " "	152	56·9%

Classification

Different clinical pictures are produced by an abortion as it passes through its successive stages; infection may be superadded to any of these so that there may be recognized:

I. (*a*) The septic inevitable abortion, in which uterine contractions have led to dilatation of the cervix, and the infected products of conception project into the cervical canal or through the external os. (*b*) The septic complete abortion, in which all the products of conception have been expelled and the infection is limited to the decidua basalis. (*c*) The septic incomplete abortion, in which the bulk of the uterine contents have been expelled but some remain behind in the infected uterus. These cases in which the infection remains intrauterine are called Type I cases of septic abortion.

II. The infection which starts in the uterus spreads to other structures in the pelvis, so that inflammation may occur in the Fallopian tubes, ovaries, pelvic peritoneum, parametria, or pelvic veins. These varieties of extrauterine spread constitute Type II cases.

III. Finally, the infection may become extrapelvic, and generalized peritonitis, septicaemia, or pyaemia may occur. These are referred to as Type III cases.

The classification of the 267 cases of abortion into these types is shown in Table I; it will be seen that in 86.5% of patients the infection remained intrauterine, in a further 10.9% it spread beyond the uterus but remained intrapelvic, whilst in 2.6% generalized spread occurred.

It has been necessary to adopt some index to denote the severity of the patient's illness in addition to this anatomical classification. The length of stay in hospital, which might at first seem a suitable guide, is not reliable, for it is often dependent upon a state of anaemia or malnutrition which calls for weeks of hospital treatment quite apart from any gynaecological disease. The index which has been chosen in this analysis is the degree of pyrexia which the patient develops, the temperature of 100.4° F. (38° C.) being arbitrarily chosen as the dividing-line; cases have been considered to be mild if this temperature has not been reached, and severe if it has been attained or exceeded.

Type I Cases: Principles of Treatment

In cases of abortion in which the infection is confined to the uterus the principles which govern its management are twofold, comprising, on the one hand, treatment to combat the infection, and, on the other hand, treatment to control the abortion. The difficulty arises in combining the two regimes of treatment, for a procedure which is beneficial for one is not necessarily so for the other, and may indeed be actually harmful. In all patients sepsis calls for increase of the general resistance, rest to the inflamed part, drainage of the uterine cavity, and the employment of appropriate antibiotic and chemotherapeutic drugs. The abortion requires treatment according to the stage of its development: (*a*) If inevitable in character no treatment is required when the abortive process is progressing satisfactorily; oxytocic drugs may be needed when no progress is being made, and immediate operative measures may be necessary when bleeding is excessive. (*b*) If the abortion is complete no active treatment is called for. (*c*) If the abortion is incomplete, emptying of the uterine cavity is necessary at some time, but should be immediate if the haemorrhage is profuse.

It will be agreed that active treatment directed towards control of the abortion interferes with the rest which the inflamed uterus requires, and must on *a priori* grounds be prejudicial to the rapid and successful elimination of the

infection, and may indeed encourage its invasion of extra-uterine territory. It should therefore be undertaken only when the danger from sepsis has subsided. This is clearly not possible when excessive bleeding is present, and in this event active control of the haemorrhage should be given priority; on all other occasions immediate operative intervention is not essential, and control of the infection should first be achieved.

In cases in which haemorrhage has to be curbed it should be done with as little local trauma as possible; for evacuation of the uterine cavity, however expertly performed, entails some manipulation, whereby infecting organisms may be disseminated. Is there any other way in which bleeding may be controlled? Experience has shown that when chorionic or placental material becomes lodged in the cervix the tone of the uterine body is inhibited and the haemorrhage increases. The heaviest bleeding seen in cases of abortion often occurs when the cervical canal contains pieces of chorion or placenta in this way, just as during the third stage of labour post-partum haemorrhage occurs when the separated placenta lies in or is pushed into the cervix. Hence the temporary control of haemorrhage by removing cervical chorionic tissue is to be preferred as an immediate measure to evacuation of the uterine body, as it causes less dissemination of infection and does not require the removal of the patient to the theatre and the administration of an anaesthetic. However, in cases in which severe bleeding results from partial detachment of the chorion from the decidua and the cervical canal lies empty, evacuation of the uterus is obligatory, as it is then the best means available for achieving haemostasis.

Other forms of intervention, such as the administration of oxytocic drugs, packing the uterus, and intrauterine douching, are not essential for the abortive process, and as they are all inimical to the treatment of sepsis they should be avoided.

Mode of Treatment of Type I Cases

The patient is admitted to an isolation ward for septic obstetrical and gynaecological cases, where she is nursed by a specially trained staff. She is propped up in bed with several pillows, but a true Fowler position is undesirable because of its immobilizing effect. An accurate medical and gynaecological history is taken and a general examination is first made, to exclude any extraneous cause of the pyrexia.

The abdomen and pelvis are then examined, and the diagnosis is made without the use of an antiseptic lubricant during the vaginal examination, as this will vitiate subsequent cultures of the vaginal swab. A catheter specimen of urine is collected and tested for the presence of urinary infection. A Sims speculum is then passed into the vagina, and a high vaginal bacteriological swab is taken for aerobic and anaerobic cultures. If chorionic material is present in the cervical canal it is gently grasped with sponge forceps and withdrawn. A full blood count and the determination of blood groups are requested from the pathologist, and if the temperature exceeds 102° F. (38.9° C.), or if rigors have occurred, blood is taken for culture.

When bleeding is excessive and the cervical canal is empty the patient is given an immediate blood transfusion if considered necessary, antibiotic therapy as described below is started, and she is transferred to the theatre for evacuation of the uterus when thought to be fit.

In the absence of severe bleeding, pending the bacteriological diagnosis, sulphonamide and penicillin therapy is begun. The technique at present employed at the West Middlesex Hospital is to give 4 g. of "sulphatriad" followed by 2 g. at four-hourly intervals, and 300,000 units of procaine penicillin twice daily. This sulphonamide mixture is used because its constituents—sulphathiazole, sulphadiazine, and sulphamerazine—by virtue of their independent solubilities in the urine and that of their acetyl derivatives, greatly reduce the danger of urinary crystallization, whilst enabling an adequate total sulphonamide blood concentration to be maintained. Six pints (3.4 litres) of fluid are given in the 24 hours; the urine is kept alkaline by 60 gr. (4 g.) of potassium citrate every four hours; and ferrous sulphate 6 gr. (0.4 g.) three times a day, or a blood transfusion, is given according to the blood picture. Of the 267 cases of septic abortion here reported, 47 (17.6%) required blood transfusion.

When the results of the cultures become available in 24 hours' time, sulphatriad or penicillin, or both, are continued, according to the nature of the infecting organism. Streptomycin in doses of 1 g. daily has been found very efficacious against sulphonamide-resistant *Bact. coli*, and is therefore used empirically when this organism is cultured and there is no clinical improvement after 24 hours' sulphonamide therapy.

Under this regime the patient may progress in one of three directions: (1) The temperature and pulse rate may fall as the sepsis is brought under control. When these have been normal for 24 hours, treatment for the abortion is adopted; if it is inevitable or incomplete in character, evacuation of the uterus is proceeded with. (2) There may be no response to treatment, and the patient's temperature and pulse rate may remain elevated or may rise. This indicates either that the drugs employed are not reaching the infected uterine contents or that the organisms are insensitive to them. The alternative treatments, therefore, are either to evacuate the uterus immediately or to carry out sensitivity tests to further antibiotics. As these latter tests take 24 hours or more to perform, during which time the septic process is increasing and placing the patient's life further in jeopardy, it has been considered unwise to adopt this refinement of therapy, and consequently, if there is no improvement after 24–36 hours' treatment, evacuation of the uterus is then carried out. (3) Severe haemorrhage may recur while treatment for the sepsis is being undertaken. If vaginal examination shows that further chorionic material is present in the cervical canal it is removed; otherwise the patient is transferred to the theatre for immediate evacuation of the uterus.

Sulphonamides and antibiotic drugs are continued after the operation until the temperature and pulse rate have been normal for 24 hours, or until some contraindication to their use arises.

Results of Treatment of Type I Cases

Surgical evacuation of the uterus under general anaesthesia was performed on 215 occasions (93% of Type I cases), being done 123 (57.2%) times after the temperature had subsided, 53 (24.7%) times in the presence of continuing sepsis, and 39 (18.1%) times because of severe haemorrhage. The danger of the operation can be judged from the proportion of cases which reached a temperature of 100.4° F. (38° C.) or above during their post-operative course or which developed extrauterine spread. It will be seen from Table II that, when evacuation was done after control of the sepsis, only 12 cases (9.8%) became severe, with spread occurring in 4 (3.2%), while operation in the presence of continuing

TABLE II.—*Proportion of Mild, Severe, and Spreading Cases Following Evacuation of the Uterus in the Presence or Absence of Pyrexia*

	Planned Evacuation with Normal Temperature	Planned Evacuation with Pyrexia	Emergency Evacuation Because of Haemorrhage	Total
No. of cases ..	123 (57·2%)	53 (24·7%)	39 (18·1%)	215
Mild cases post-operatively ..	111 (90·2%)	26 (49·1%)	21 (53·8%)	158
Severe cases post-operatively ..	12 (9·8%)	27 (50·9%)	18 (46·2%)	57
Followed by pelvic spread	4 (3·2%)	7 (13·2%)	1 (2·6%)	12
Followed by general spread	—	—	—	—

sepsis was followed by 27 (50.9%) severe cases and spread in 7 (13.2%). When done because of haemorrhage, before control of the sepsis had time to be established, 18 cases (46.2%) had a severe convalescence, and spread occurred in 1 (2.6%). It will be seen that the results obtained in apyrexial cases are much superior.

Although the principles of treatment have remained unaltered it should be appreciated that antibiotic control has become more efficient during the later years of this five-year period; many cases which were evacuated in the presence of sepsis in 1946 would in 1950 have been first rendered apyrexial by larger doses and more efficient drugs. The figures showing an increased incidence of severe cases and of extrauterine spread after operating in the presence of sepsis cannot altogether be ascribed to the hazards of local intervention, and therefore be submitted to accurate statistical analysis, for the persistence of the pyrexia indicates that the infection is due to more virulent organisms less sensitive to antibacterial agents, or more inaccessible to their effects.

Improved results were not obtained by delaying operation for longer than 24 hours once the temperature had fallen to normal as suggested by Browne (1951), who advises a wait of five days before operating. Table III shows that both

TABLE III.—*Proportion of Mild, Severe, and Spreading Cases Following Evacuation of Uterus after Varying Periods of Apyrexia*

	Evacuation after 24 Hours	Evacuation after 2 Days	Evacuation after 3 Days	Evacuation after More than 3 Days	Total
No. of cases ..	53	25	26	19	123
Mild cases post-operatively ..	46 (86·8%)	23 (92%)	23 (88·5%)	19 (100%)	111
Severe cases post-operatively ..	7 (13·2%)	2 (8%)	3 (11·5%)	0	12
Extrauterine spread ..	2	0	1	1	4

severe cases and extrauterine spread occurred in approximately equal proportions whether operative intervention took place after 24 hours' apyrexia or was deferred for two, three, or more days.

Technique of Operation

A brief description of the technique of evacuation of the uterus may be advisable, as it is not considered an operation suitable for the beginner, who should be supervised on many occasions by a senior gynaecologist before being allowed to operate on his own.

The shaved vulva and the vagina are thoroughly dried pre-operatively, and are then painted with 1/1,000 acriflavine in spirit. After catheterization of the bladder the position of the uterus is determined, the cervix is grasped with sponge forceps or a vulsellum, the whole or half hand is introduced into the vagina, and the forefinger is passed through the cervix into the cavity of the uterus. Placental tissue is gently separated from the uterine wall by the finger, whilst the uterus is steadied by the other hand placed on the abdominal wall, and is then withdrawn by ovum or sponge forceps. This manœuvre is repeated until the uterine cavity is felt to be empty. It is dangerous to pass a uterine sound into the soft uterus for fear of perforation, and this should not be done.

If the os is not dilated enough to permit passage of the finger, graduated dilators may be employed, provided they are passed gently and care is taken not to tear the cervical tissues. It has been stated by some observers that dilatation of the cervix at the time of operation worsens the prognosis. Table IV shows that it had no prejudicial effect upon 87 (40.5%) patients in whom it was used, as their convalescence was no worse than that of 128 (59.5%) patients in whom evacuation was possible without preliminary instrumental dilatation.

TABLE IV.—*Effect of Dilatation of the Os upon the Post-operative Course of the Disease (Type I Cases)*

	Evacuation Alone	Dilatation and Evacuation	Total
No. of cases	128	87	215
Mild cases post-operatively ..	82 (64·1%)	76 (87·4%)	158
Severe cases post-operatively ..	46 (35·9%)	11 (12·6%)	57
Extrauterine spread	7 (5·5%)	5 (5·7%)	12

Curettage of the uterus is unnecessary, and may do harm by opening up lymphatic channels, while oxytocic drugs may disperse organisms along them by inducing uterine contractions. Uterine packing will impede drainage of the cavity and should be avoided, together with douches, which disseminate infection along the tubes into the peritoneal cavity. Bleeding is best controlled by complete evacuation of the uterus; if necessary gentle bimanual compression may be applied.

Type II Cases

These patients, in whom spread of infection has occurred into the pelvic tissues, show evidence of salpingo-oophoritis, pelvic cellulitis, pelvic peritonitis, or pelvic phlebitis, the last condition perhaps spreading to involve the veins of the legs. They are managed in the same way as Type I cases, being nursed in an upright position in bed with a kaolin poultice applied to the lower abdomen to relieve pain if necessary, and being given sedatives to ensure a good night's sleep. Aperients or enemata are sometimes required. A correct fluid balance is maintained and antibiotic drugs are given subject to bacteriological control. If there is an inadequate response to therapy, sensitivity tests are carried out against sulphonamides, penicillin, streptomycin, "aureomycin," chloramphenicol, and propamidine, when the cheapest drug to which the organism is sensitive is administered. Except in the presence of severe haemorrhage due to retained products, local intervention is interdicted in these cases.

Usually the infection is brought rapidly under control with this treatment. Sometimes an abscess forms and requires drainage; if in the pelvis it should be opened by incision when a fluctuant swelling becomes palpable per vaginam or per rectum, whilst if it rises into the abdomen its outline should be mapped with a skin pencil, and laparotomy and drainage should be performed if it continues to enlarge despite treatment.

Among the 29 cases encountered during the five-year period, operative drainage of a pelvic abscess was indicated on two occasions, once by posterior colpotomy and once by laparotomy. Blood transfusions are often necessary for these cases.

Type III Cases

In these patients, in whom further spread of the infection has occurred, general peritonitis, septicaemia, or pyaemia is present. Treatment is given along the same lines as the other types of cases, with skilled nursing, fluids administered by the intravenous route if required, and appropriate antibiotic therapy. Pyaemic abscesses should be opened and drained if the procedure is surgically feasible.

Follow-up Treatment.—When patients with extrauterine infections responded favourably to treatment and felt fit for discharge from hospital they were sometimes found on pelvic examination to have enlarged or thickened uterine adnexa, not tender on palpation, with a uterus either fixed and displaced in position or with its mobility impaired. These patients were given a course of intrapelvic diathermy twice weekly, which was continued until the pelvic organs felt normal on palpation, or until maximum resolution of the masses had occurred. The first two or three menstrual periods after discharge from hospital were often profuse and painful, but the normal menstrual rhythm and loss were speedily regained in most cases.

Criminal Interference

It is notoriously difficult to obtain reliable histories from patients suffering from septic abortion, and it is often suspected that criminal interference, which the patient will not acknowledge, has taken place. It is considered that some light may be thrown on this problem if the clinical progress of cases of confessed interference is compared with that of cases in which it is denied. Table V shows that the proportion of severe cases, and of cases complicated by extrauterine spread, is almost the same in the two groups. This may suggest that criminal intervention has little influence on the course of the disease, or, alternatively, that most cases are subject to such interference; probably the latter contention is the more correct, and most cases of septic abortion can be considered to be criminal in origin. The reverse, however, is not true, as a history of instrumental interference is sometimes given by patients suffering from complete or incomplete abortion in whom there is no clinical evidence of sepsis during the whole course of their illness.

TABLE V.—*Relation of a History of Criminal Interference to the Severity of Infection*

	Interference Acknowledged	Interference Denied	Total
No. of cases	79	188	267
Mild cases on admission ..	39 (49·4%)	76 (40·4%)	115 (43·1%)
Severe cases on admission	40 (50·6%)	112 (59·6%)	152 (56·9%)
Type II cases	9 (11·4%)	20 (10·6%)	29
„ III „	6 (6·3%)	2 (1·1%)	7

The Causal Organism

Identification of the infecting organism was possible in most cases, although it was sometimes surprising (and disappointing) that no growth could be obtained from cultures of high vaginal swabs even when the infection was known clinically to be severe. This lack of bacteriological aid illustrates the necessity for beginning empirical antibiotic treatment before the results of cultures become available.

The types of organism present are shown in Table VI, along with the proportion of mild and severe cases and those developing extrauterine spread in association with each organism. Where mixed growths were obtained, the causal pathogen alone is indicated. It will be seen that *Bact. coli* was present in 99 (37.1%) cases, 57 (57.6%) of which were severe in character, while spread occurred in 16 (16.2%).

TABLE VI.—*Relating the Severity of the Disease to the Infecting Organism*

Organism	Cases		Classification				Type II Pelvic Spread	Type III General Spread
			Mild		Severe			
	No.	%	No.	%	No.	%		
Staph. pyogenes	19	7·1	6	31·6	13	68·4	2	0
Staph. saprophyticus ..	44	16·5	22	50·0	22	50·0	10	0
Haemolytic streptococcus	14	5·2	3	21·4	11	78·6	2	1
Non-haemolytic streptococcus	27	10·1	13	48·1	14	51·9	0	1
Anaerobic streptococcus	5	1·9	2	40·0	3	60·0	0	0
Bact. coli ..	99	37·1	42	42·4	57	57·6	11	5
Cl. welchii ..	4	1·5	1	25·0	3	75·0	0	0
No growth ..	55	20·6	26	47·3	29	52·7	4	0
Total ..	267	100	115		152		29	7

The haemolytic streptococcus was encountered on only 14 (5.2%) occasions; 11 (78.6%) of these infections, however, were severe, and spread occurred in 3 (21.4%). The haemolytic streptococcus Group A was isolated from only 3 patients.

Cl. welchii and anaerobic streptococci were also encountered very occasionally (4 and 5 times respectively) as the causative organisms in this survey.

Mortality

During these five years two patients have died, giving a septic abortion mortality rate of 0.75%, and a total abortion mortality rate of 0.09%. The mortality rates reported by observers in recent years are shown in Table VII. These are in no sense comparable, for different workers employ different criteria of sepsis or quote none at all. FitzGibbon (1947), Purdie (1947), and Stallworthy (1948) include only inevitable, incomplete, and septic cases among their total numbers of abortions, while Studdiford (1950) also includes complete and missed cases (but only up to the 20th week of pregnancy), and Davis (1950) combines all types, including threatened, therapeutic, ectopic, and molar abortions. The two deaths in the present series occurred as follows.

1. The patient submitted to an intrauterine injection of "lysol" and was admitted in a moribund condition with signs of general peritonitis and septicaemia. She died shortly after admission. At necropsy two large perforations of the uterus were found, with an extensive area of sloughing extending up the posterior wall of the uterus from the cervix. The infecting organism was *Bact. coli*.

2. The patient was admitted suffering from an incomplete abortion, and, as she appeared quite fit and was free from clinical evidence of sepsis, evacuation of the uterus was performed. Twelve hours later she collapsed and died. There were no post-mortem signs of injury, and the pathologist considered she had died from septicaemia.

Conclusions

There is no doubt that the immediate prognosis of septic abortion has been considerably improved by the introduction of blood transfusions and antibacterial drugs into gynaecology, whatever other form of treatment is employed in addition. Although the mortality rate has been reduced to below 1%, fatal cases will continue to be seen from time to time because criminal interference may cause severe internal damage; and the postponement of legitimate therapy, owing to a desire for secrecy, makes it too late for the patient to be rescued.

After reviewing the treatment received by these 267 cases of septic abortion, and the associated low mortality rate, it is felt that the division of gynaecologists into two schools—the interventionists and the non-interventionists—is to be

TABLE VII.—*Mortality Rates*

Author	Years	No. of Abortions		No. of Deaths		Mortality Rate	
		Total	Septic	Total Abortions	Septic Abortions	Total Abortions	Septic Abortions
FitzGibbon	1919–26	1,952	—	6	—	0·31%	—
Davis	1935–50	2,665	—	6	—	0·26%	—
Ramsay (1948)	1937–46	—	1,430	—	47	—	3·29%
Stallworthy	1939–48	803	85	1	1	0·12%	1·18%
Studdiford	1940–9	4,129	1,579	—	17	—	1·08%
Bishop	1942–7	2,317	239 out of 1,380	10	10 (8*)	0·43%	4·18% (3·35%*)
Purdie	1945	481	—	2	—	0·42%	—
West Middlesex cases ..	1946–50	2,322	267	2	2	0·09%	0·75%

* Corrected figure.

deprecated. In fact, any fixed routine of treatment for these cases is undesirable, and it is preferable for each case to be treated individually on its merits according to recognized surgical principles. Thus if haemorrhage is severe it should primarily be arrested by the appropriate surgical measures, while if sepsis is the dominant feature it should first be treated by rest and antibacterial drugs. If this is unsuccessful in the presence of the source of infection after a trial period of 36 hours, the uterine contents should be removed. The convalescence is likely to be more prolonged and severe in these patients, but in the end a satisfactory result will be obtained. It is of no advantage to wait for a longer period than 36 hours of sulphonamide and antibiotic therapy before intervening, for if the infection by then shows no sign of responding to drugs it is unlikely to do so later, unless sensitivity tests are carried out, which are too time-consuming to be done whilst awaiting operation. After evacuation of the uterus, and in Type II and Type III cases, they are invaluable in dealing with resistant organisms.

When the infection has been eliminated, the abortion, if it is inevitable or incomplete, should be treated by evacuation of the uterus. This is best done 24 hours after the temperature and pulse rate have reached a normal level, for although no evidence has been forthcoming that infection may arise in an incomplete abortion when evacuation is delayed, as Stallworthy (1948) suggests, there is definite evidence that improved results are not obtained by delaying operation for longer than this period. If the abortion is complete, as recognized by the character of the lochia and the involution of the uterus, evacuation is unnecessary.

Owing to the efficiency of the modern drugs now available, it is agreed that good results are achieved by both the interventionist and the non-interventionist schools; it is claimed, however, from the present analysis, that the severity and duration of the patient's illness and the mortality rate are reduced to a minimum when a fixed regime of treatment is avoided and operation, if carried out at all, is done at the optimum time for each individual patient. In this series this procedure has involved operation in 93% of cases of intrauterine infection, and the best results have been obtained in those patients in whom the sepsis was controlled before operation.

Modern drugs and blood transfusions are the basis of the successful treatment of patients suffering from septic abortion; most cases, however, still require a planned operation performed by an expert gynaecologist to ensure the best chance of a short illness and the reasonable expectation of future pregnancies to follow.

Summary

An analysis is presented of 267 cases of septic abortion among 2,322 cases of abortion of all types occurring at the West Middlesex Hospital during the five years 1946–50 inclusive.

The septic abortions are classified into three types, dependent upon the anatomical extent of the infection, and into mild or severe clinical cases according to the degree of pyrexia.

The treatment required for an abortion in its different stages and the treatment of sepsis are discussed in so far as they may be complementary or antagonistic.

The results of evacuation of the uterus, which was performed in 215 (93%) cases of uterine infection, are described. Evacuation was performed in 123 (57.2%) cases when the temperature had subsided, in 53 (24.7%) in the presence of continuing sepsis, and in 39 (18.1%) because of severe haemorrhage.

Improved results after evacuation were obtained in the apyrexial cases.

The length of apyrexia before operation did not influence the post-operative convalescence.

The technique of evacuation of the uterus in septic cases is described.

There was no difference in the clinical course of disease in patients who confessed to criminal instrumentation and those who denied it.

Bact. coli infections occurred in 37.1% of cases; staphylococci were present in 23.6%, and haemolytic streptococci in only 5.2%.

A septic abortion mortality rate of 0.75% was obtained, with an overall abortion mortality rate of 0.09%.

Thanks are due to my colleagues of the obstetric and gynaecological department who have collaborated in this survey; special appreciation must be accorded to the sister and nurses of the isolation ward (H2), without whose skill these results would not have been possible.

REFERENCES

Bishop, I. R. (1948). *Proc. roy. Soc. Med.*, **41**, 318.
Browne, F. J. (1951). *Antenatal and Postnatal Care*, p. 195. Churchill, London.
Davis, A. (1950). *British Medical Journal*, **2**, 123.
FitzGibbon, G. (1947). *J. Obstet. Gynaec. Brit. Emp.*, **54**, 838.
Purdie, A. W. (1947). *British Medical Journal*, **2**, 272.
Ramsay, A. M. (1948). *Proc. roy. Soc. Med.*, **41**, 317.
Stallworthy, J. (1948). Ibid., **41**, 322.
Studdiford, W. E. (1950). In *Progress of Gynaecology*, 2, p. 437, edited by J. V. Meigs and S. H. Sturgis. Heinemann, London.

POST-MORTEM DIAGNOSIS OF AIR EMBOLISM BY RADIOGRAPHY

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The post-mortem diagnosis of air embolism depends upon the demonstration of bubbles of air within the blood vessels and within one or more of the heart cavities. Bubbles of gas may be found in the blood vessels within a relatively short period after death, through the action of spore-bearing, gas-producing organisms. Bubbles of gas may also pass into the blood vessels through manipulation of the viscera during necropsy (Simpson, 1942). It is therefore necessary to exclude both these possibilities before air embolism can be diagnosed.

Burn (1934a) has shown that spore-bearing gas-producing organisms—for example, *Clostridium welchii*—are capable of invading the tissues of guinea-pigs and rabbits within 5–48 hours after death if the animals are kept at 25° C. In a further study, similar organisms were cultured from human necropsy specimens of the internal organs. The post-mortem interval in these cases was from 1 to 4 hours (Burn, 1934b). Consequently, anaerobic bacteriological examinations are an important part of the post-mortem examination.

In order to prevent air bubbles passing into the blood vessels during dissection it is necessary to ligate all vessels before sectioning. Shennan (1935) has recommended the following procedure in cases of suspected pulmonary air embolism: a small incision is made in the parietal pericardium; the sac is then filled with water and the right ventricle is opened *in situ*. The escaping air can then be detected. However, this procedure has limitations. Unless the main arterial and venous trunks are ligated before incision of the heart, air may, through handling of the organ, enter the blood vessels. Moreover, blood samples for bacteriological culture

should be taken from the heart and the peripheral blood vessels. Shennan's procedure is a distinct disadvantage in the aseptic collection of blood specimens.

It would appear that radiological examinations carried out within a short period of death are a most satisfactory means of diagnosis. The presence of air in the blood vessels and in the heart cavities can be seen with certainty. Moreover, this procedure provides an indication of the most satisfactory dissection technique to be adopted in order to observe the full necropsy findings. This procedure was followed in the two cases of air embolism reported below. Regional radiological examinations were made on the cadavers within an hour of death. It is unlikely that air detected by radiological means within an hour of death could be accounted for by the presence of gas-producing organisms in the two cases studied.

Chase (1934) reported the successful use of post-mortem stereoscopic examinations of the skull, which demonstrated the presence of air in the cranial vessels in a fatal case of arterial air embolism. The stereoscopic pictures of the skull showed shadows resembling air outlining the anterior portion of the circulus arteriosus, and extending along the course of the middle cerebral artery. The air in the smaller meningeal vessels appeared as an irregular network of fine pale lines most marked in the parietal and temporal regions of the skull. In this case the chest was radiographed but no air shadows were detected.

In order to overcome difficulties in the demonstration of air embolism by dissection methods in cases of rapid death following upon criminal abortion, Gordon (1945) suggested the use of post-mortem radiological examinations of the pelvis prior to necropsy, in order to detect the presence of air emboli in the uterine plexus and pelvic veins.

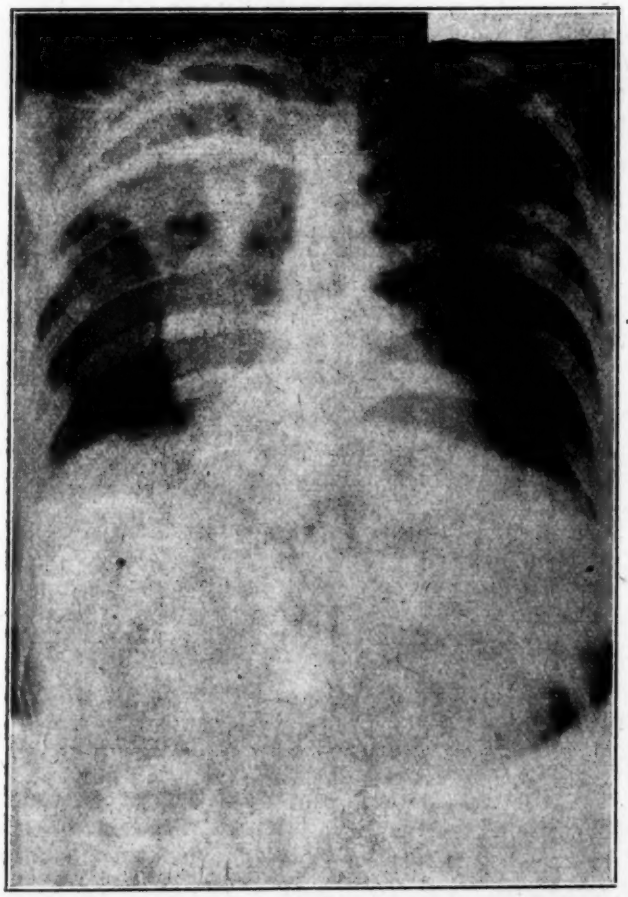

FIG. 1.—Radiograph of Case 1.

Case 1

A European woman, aged 52, was admitted to hospital for pneumothorax therapy. The initial manometer reading for a refill was 0 mm. Hg, and some 50–60 ml. of air was introduced. She suddenly collapsed and became dyspnoeic, frothy sputum being seen at the mouth.

Radiological examinations were made within one hour of death. *Chest:* Both domes in the diaphragm were in the cadaveric position. The right upper lobe had collapsed, and the cavity in the left mid-zone persisted. No pneumothorax was visible. The heart, trachea, and mediastinum were deviated to the right and free air appeared to be present in the mediastinum. Dappled translucencies in the left ventricular region might well represent froth. The ascending aorta and its arch were distended with air (Fig. 1). The air column extended to the innominate artery and to the common and internal carotid arteries. The right subclavian artery was outlined by air in its first part. *Skull:* No free air was visible in the cranium. *Abdomen and Pelvis:* Intestinal contents masked any free air which might be present in the vascular system.

Necropsy Findings.—A post-mortem examination was carried out two and a half hours after death. Apart from the tuberculous lesions of the chest, the main pathological findings were confined to the cardiovascular system. Special care was taken during the dissection to ligate the blood vessels before section, and the demonstration of air emboli was carried out *in situ*. Frothy blood was found in the left ventricle and in the ascending aorta, the aorta-arch, abdominal aorta, the common carotid arteries, common iliac arteries, the internal carotid artery, and the circulus arteriosus. In the small vessels, such as the coronary arteries and the cerebral arteries, the air emboli appeared as columns interspersed with blood within the vessel walls. The blood on the venous side of the circulation was fluid in consistence. The right ventricle, jugular veins, inferior vena cava, and the meningeal sinuses were opened *in situ*. No air emboli were seen within the coronary veins or the mesenteric veins. On the antero-lateral aspect of the superior lobe of the lung there was an area of haemorrhage between the pleurae and the lung tissue, where it was deep to the skin-puncture mark. It is possible that the air entered the pulmonary venous system at this site.

Case 2

An Asiatic woman aged 36 was admitted to hospital suffering from bronchogenic tuberculosis of the left lung. Sixteen days before death an artificial pneumoperitoneum was induced. At the first refill the initial manometer reading was 0 mm. Hg. Approximately 300 ml. of air was introduced. The patient suddenly collapsed and convulsive movements of the arms, legs, and the face developed. She died 35 minutes after the onset of these symptoms.

Radiological examinations were made within one hour of death. *Chest:* Gas outlined the right auricle, the right ventricle, the pulmonary artery, its main branches, and their subdivisions. No free gas was visible in the left side of the heart (Fig. 2). *Abdomen:* The stomach and duodenum were excessively dilated (possibly owing to the post-mortem attempts at resuscitation). Free gas was present under the left dome of the diaphragm and on the anterior border of the liver (Fig. 3). The splenic vein was moderately well outlined, through the gas in the stomach, in the antero-posterior view. The main portal vein and its branches were not unequivocally demonstrated. However, the air-filled vessel opposite the level of the disk between the bodies of the first and second lumbar vertebrae might represent the portal vein and its right and left branches (Figs. 3 and 4). The intrahepatic vessels were well demonstrated, as was the left

hepatic vein. This was seen to join the inferior vena cava opposite the body of the 12th thoracic vertebra. *Skull:* No air-filled vessels were visible.

Necropsy Findings.—A post-mortem examination was carried out three and a half hours after death. The main pathological findings, apart from the tuberculous lesions, were present in the cardiovascular system. Frothy blood was present in the right ventricle, pulmonary arteries, inferior vena cava, common iliac veins, portal vein, splenic vein, and the mesenteric veins. Columns of air were seen in the coronary veins, the tributaries of the mesenteric veins, internal mammary veins, and the tributaries of the external jugular veins. Air emboli were not detected in the arteries (except the pulmonary artery), the left cardiac cavities, internal jugular veins, or the meningeal sinuses. Ligation of the vessels before section was carried out in each instance and the examinations were made *in situ*. A small quantity of blood clot was present in the left hypochondrium, and blood clot was seen at the hilum of the spleen. (The skin-puncture mark was situated at the tip of the ninth left costal cartilage.) It may be that the air entered the portal venous system through one of the tributaries of the splenic vein. Frothy blood was present in the large veins of the liver.

Further morbid anatomical and histological findings in these two necropsies are not relevant to the discussion.

FIG. 2.—Radiograph of Case 2.

FIG. 3.—Radiograph of Case 2.

Pathogenesis of Air Embolism

Arterial Air Embolism

Moore and Braselton (1940) injected air into the pulmonary veins of anaesthetized cats, and observed air emboli in the coronary arteries within a few seconds. This was rapidly followed by ventricular fibrillation; the myocardium became pale and the ventricles dilated—that is, a rapid myocardial ischaemia resulted. The signs of cerebral anoxia followed the onset of ventricular fibrillation. The authors concluded that death in these cases was due to ventricular fibrillation resultant upon coronary occlusion, the cerebral anoxia being a secondary manifestation. The work of Durant *et al.* (1949) supports the view of the occurrence of myocardial ischaemia. They injected air into the coronary arteries of dogs and observed electrocardiographic tracings which showed evidence of gross myocardial ischaemia.

In man, however, air emboli have been demonstrated in the terminal branches of the cerebral arteries. Chase (1934) postulated that death may be due to loss of function of the vital centres resultant upon both the mechanical obstructive and the neurovascular paralytic and haemostatic effects of the air emboli. The detailed observations of the mesenteric

FIG. 4.—Radiograph of Case 2.

blood vessels of rabbits following the injection of air into the aorta have shown that the effects of air emboli are not only mechanical but also neurovascular.

Pulmonary Air Embolism

Forbes (1944) postulated that death in these cases may be due to (*a*) mechanical interference with the function of the heart through the presence of frothy blood in the right ventricle, to which the signs of cerebral anoxia are secondary; (*b*) blockage of the pulmonary artery; or (*c*) the obstructive effects of multiple air emboli in the smaller arterioles of the lungs.

In the case reported above air emboli were not observed in the left side of the heart or in the cerebral arteries, and it was assumed that the air entered the circulation through one of the tributaries of the splenic vein. Air emboli were observed in the portal venous system and parts of the systemic venous circulation. It is therefore of interest to consider whether air emboli are capable of passing through the hepatic sinuses. If air emboli are prevented from passing the hepatic sinuses one of the portal venous systemic anastomoses in the liver may be involved, or one of the collateral portal venous anastomoses. Curtillet and Curtillet (1939c) showed the passage of air emboli from the arterial to the related venous side of the circulation, following the injection of air into the arteries of the limbs of dogs. They concluded that the air passed through the arteriovenous anastomoses in the limbs. These results, however, have not been observed in the internal organs of animals (Curtillet and Curtillet, 1939a, 1939b; Chase, 1934).

Summary

A case of arterial air embolism and one of pulmonary air embolism are reported.

The difficulties in the post-mortem diagnosis are discussed.

In each case necropsy was preceded by regional radiographic examinations of the cadavers. The results of these examinations are reported, with radiographs.

It is shown that radiological examinations are a useful adjunct to the actual diagnosis, and also prove a guide to the most advantageous method of dissection to be followed in each case.

Adequate bacteriological examinations are an essential part of the post-mortem investigations.

The mechanism of death in the two types of air embolism is discussed, with special reference to the circulatory pathways involved in the embolic phenomena.

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References

Burn, C. G. (1934a). *J. Infect. Dis.*, **54**, 388.
—— (1934b). Ibid., **54**, 395.
Chase, W. H. (1934). *Surg. Gynec. Obstet.*, **59**, 569.
Curtillet, E., and Curtillet, A. (1939a). *C.R. Soc. Biol., Paris*, **130**, 645.
—— —— (1939b). Ibid., **130**, 647.
—— —— (1939c). Ibid., **130**, 650.
Durant, T. M., *et al.* (1949). *Amer. Heart J.*, **38**, 481.
Forbes, G. (1944). *British Medical Journal*, **2**, 529.
Gordon, I. (1945). *Clin. Proc.*, **4**, 135.
Moore, R. M., and Braselton, C. W. (1940). *Ann. Surg.*, **112**, 212.
Shennan, T. (1935). *Post-mortems and Morbid Anatomy*, p. 153. Arnold. London.
Simpson, K. (1942). *Lancet*, **1**, 697.

Application has been made by the French Government on behalf of Morocco for admission as an Associate Member of the World Health Organization, and will be submitted to the Fifth World Health Assembly which opens in Geneva on May 5. Of the 79 countries which have joined W.H.O., Southern Rhodesia is so far the only Associate Member.

PROLONGED ANTICOAGULANT THERAPY WITH HEPARIN

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The use of the anticoagulant drugs dicoumarol and "tromexan" in the treatment of thrombo-embolic disease is restricted to institutions equipped for performing daily prothrombin estimations. There is, therefore, a need for a safe anticoagulant which can be used where facilities for this test are not available. Heparin would be suitable if the practical difficulties associated with its prolonged intravenous administration could be overcome. The use of an indwelling needle has been recommended by Jorpes (1946) and Forrester (1949), and fine-bore polythene tubing by MacFadyen (1949) to avoid frequent venepuncture. When more than ten days' treatment is required it is usually necessary to resort to intramuscular administration.

In order to determine whether heparin could be satisfactorily administered for long periods, 37 patients with thrombo-embolic diseases were treated for periods of up to five weeks: 20 were suffering from acute myocardial infarction, 2 from acute coronary insufficiency, 7 from acute venous thrombosis, 4 from acute pulmonary embolism, and 4 from embolism of peripheral arteries.

Techniques

Intravenous Administration.—A needle or cannula with an attached Gordh adapter (Forrester, 1949) was inserted into a forearm vein at wrist level and strapped down. Heparin was given four-hourly in doses of 50–75 mg. through the diaphragm of the adapter. A fine-bore polythene tubing was also used, but it was found to be less satisfactory than a needle, except when the only suitable vein was in the antecubital fossa. The flexible tubing then permitted free movement at the elbow.

Intramuscular Administration.—A concentrated aqueous solution containing 250 mg. of heparin per ml. (approximately equal to 25,000 Toronto units*) was used. Two ml. of 1% procaine was mixed with each dose of heparin, which was given through fine short needles (S.W.G. 23, 24, serum gauge VI). The heparin solution used initially was hypertonic, but later an isotonic solution of the same strength† was employed.

Estimation of Coagulation Times.—A modified Lee-White method was used (Quick *et al.*, 1948). The average time taken for blood to clot in three dry tubes at 37° C. in the patients undergoing anticoagulant therapy and in 50 normal controls was six minutes, the range being five to eight minutes. Coagulation times were estimated twice daily: one hour after intravenous, four hours after intramuscular injections, and again just before the next dose with both routes. These represent approximately the maximum and

*The preparation was standardized in units, and the number of units per mg. varied slightly from batch to batch.

†Pularin, supplied by Evans Medical Supplies Ltd., Liverpool.

minimum prolongation of the coagulation time. Nine patients received intravenous heparin alone, 23 had intramuscular heparin alone, and five had intravenous followed by intramuscular heparin. Intravenous dosage was given for 3 to 14 days (average duration six days), intramuscular dosage lasted for 4 to 42 days (average duration 19 days). Alternative time/dosage schedules were often employed in the same subjects at different periods (see Table II).

Results of Intravenous Administration

Effect on Coagulation Times.—In most cases 50–75 mg. every four hours resulted in prolongation of the maximum clotting-time to levels of from 16 to 60 minutes. This prolongation was transient, and the minimum clotting-time was found to be almost normal at the end of four hours (Table I). When 75 mg. was given four-hourly there was

TABLE I.—*Coagulation Times Produced with Intravenous Heparin*

Dosage	No. of Cases	Coagulation Time (Lee-White) in Minutes	
		Maximum* Range	Minimum* Range
50 mg. 4-hourly	12	41–16	14–6
75 ,, ,,	2	60–24	15–8

* The maximum and minimum readings are those one hour after an injection and just before the next injection respectively.

no significant summation of effect over a period of five days. Cumulative action resulted when larger doses were used, as in one patient who was given 125 mg. four-hourly in error. By the third day the minimum coagulation time was over 60 minutes, although the patient suffered no untoward effects other than a brief rigor, and no haemorrhage other than slight oozing of blood round the needle.

Local Reactions.—The duration of intravenous heparin therapy was restricted by the development of local infection round the indwelling needle. However, it was usually found unnecessary to change the site of the needle before the fifth or sixth day; in two cases the needle was retained for eight and ten days respectively before treatment was discontinued. By changing the site of the needle periods of 10 to 14 days' continuous therapy were achieved. Thrombophlebitis occurred in four cases, in three of which polythene tubing had been used.

Results of Intramuscular Administration

Effect on Coagulation Times (Table II).—The maximum effect of a single injection of 150 mg. of heparin was reached in three to four hours and was maintained above twice the normal clotting-time for 9 to10 hours. There was no significant effect after about 12 hours, except in one case. Individual variation in heparin sensitivity, as has been reported for intravenous heparin (de Takats, 1943, 1950), was found to occur. In two cases which were more sensitive, a single dose of 150 mg. of heparin produced coagulation times of 30 and 20 minutes respectively at the end of 12 hours. Heparin resistance was demonstrated in another case in which 150 mg. prolonged the clotting-time for only six hours. An isolated injection of 250 mg. of heparin prolonged the coagulation time to at least twice the pre-heparin level for 12 hours. Fig. 1 shows the response to isolated intramuscular doses of 250, 150, and 100 mg. Although the response to single doses on different occasions was somewhat variable, the curves are representative of the average effect of these doses.

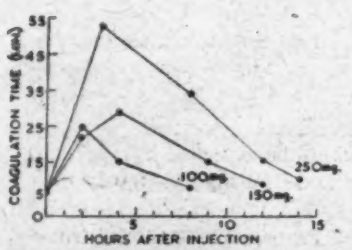

FIG. 1.—The effect of isolated doses of 100 mg., 150 mg., and 250 mg. of heparin respectively, given intramuscularly in the same patient.

TABLE II.—*Coagulation Times Produced by Prolonged Intramuscular Administration of Heparin*

Heparin Dose	Case No.	Duration of Treatment in Days	Normal Coagulation Time	Coagulation Times (Lee-White) (Minutes)	
				Maximum* Range	Minimum* Range
100 mg. 8-hourly	2	21	5	28–20	21–16
	7	8	7	19–12	11–9
	10	3	5	30–21	18–14
	11	9	6	27–20	16–12
	13	7	6	32–24	15–10
	9	2	8	46–38	36–28
	26	7	6	33–26	19–14
	30	16	5	31–25	17–13
	34	4	7	38–30	27–23
125 mg. 8-hourly	1	10	5	50–25	22–14
	3	13	7	32–26	19–13
	4	4	5	40–27	28–15
	5	4	5	24–16	16–10
	17	11	5	26–15	15–10
	24	5	5	30–18	23–12
	26	7	6	44–30	24–17
	30	4	5	39–26	23–15
	33	7	5	34–29	26–13
150 mg. 8-hourly	5	8	5	34–24	27–17
	8	23	5	23–14	15–8
	25	2	5	35–25	26–18
	30	5	5	42–30	28–18
150 mg. 12-hourly	1	16	5	48–28	17–12
	2	2	5	30–26	16–13
	3	4	7	26–20	13–9
	4	13	5	30–20	16–11
	6	25	6	27–16	18–12
	7	20	7	22–15	17–10
	10	13	5	24–21	15–13
	13	24	7	53–28	22–16
	14	37	6	32–20	16–12
	15	6	5	50–38	22–16
	19	7	5	57–35	24–15
	20	20	8	49–32	21–12
	21	10	7	48–29	24–14
	22	1	7	120	30
	9	23	8	34–26	22–14
	12	19	7	30–24	15–12
	23	18	8	35–27	20–12
	25	8	5	28–20	15–10
250 mg. daily	30	2	5	54–46	7–6
	14	5	6	58–48	9–7
	1	4	5	35–28	8–4
	3	2	7	26–22	7–5
250 mg. 12-hourly	30	2	5	60–50	26–18
	1	2	5	48–32	24–20
	3	3	7	40–32	24–16

* The maximum and minimum readings are those four hours after an injection and just before the next injection respectively.

It will be seen that increasing the dose increases both the degree of prolongation of clotting-time and the duration of effect, the former being slightly more pronounced than the latter.

Local Reactions.—The isotonic solution was found to be less locally irritant than the hypertonic, and when the former was given with 1–2 ml. of 1% procaine the injections were well tolerated until the dose exceeded 150 mg. With larger doses local aching pain and stiffness frequently resulted within two to three hours. Painful nodules and haematomata occurred in half the patients, and in seven the injections had to be stopped. Three of these patients were elderly and were noted to have developed small bruises after injections of other drugs. All the haematomata resolved without complications, although one required aspiration. When the injections were given in the arms firm local pressure, applied after the injection for 15 to 20 minutes by means of a sphygmomanometer cuff inflated to 50–60 mm. Hg, reduced the tendency to bruising. When the minimum coagulation time was maintained at more than twice normal, local bleeding increased.

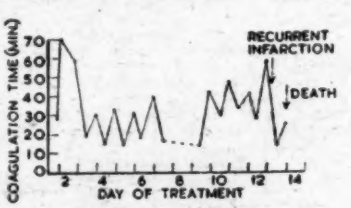

FIG. 2.—Fatal recurrent myocardial infarction occurring on the thirteenth day of treatment, despite adequate lengthening of coagulation time, in a patient hypersensitive to heparin. Dose of heparin: 150 mg. 12-hourly for two days and then 100 mg. 12-hourly.

Therapeutic Results.—The effectiveness of anticoagulant therapy in thrombo-embolic disease clearly cannot be assessed from this small series, but the results are of interest. Twenty-six patients who received intramuscular heparin had no further thrombosis, but two patients suffering from myocardial infarction had further attacks which may have been thrombotic. The first had a clinically mild recurrence of infarction on the 25th day of treatment, despite the fact that 150 mg. of heparin 12-hourly had maintained the minimum coagulation time above 15 minutes throughout. The second patient had an acute episode suggesting a recurrent infarction on the 13th day of treatment and died the next day despite the high levels at which the clotting-times had been maintained (Fig. 2). Permission for necropsy was refused. This must be regarded as failure of heparin therapy rather than of the intramuscular route of administration.

Comment on the Two Methods

The intravenous route of heparin administration, using an indwelling needle with a Gordh adapter, is the method of choice when only 10 to 14 days' treatment is required. Intramuscular injections of heparin should be as small and as infrequent as is consistent with adequate anticoagulant effect, in order to reduce the severity of local reactions. These can also be reduced by the use of a concentrated isotonic solution mixed with procaine, and firm pressure applied over the injection site after the injection.

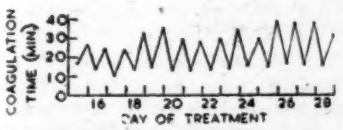

FIG. 3.—Daily coagulation times four and 12 hours after an injection in a case receiving 150 mg. of heparin intramuscularly 12-hourly. A stable prolongation at an adequate level was achieved.

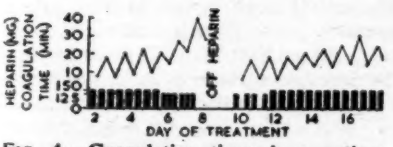

FIG. 4.—Coagulation times in a patient with myocardial infarction treated with intramuscular heparin, showing summation effect with a dose of 125 mg. eight-hourly.

We accepted the view of Allen *et al.* (1947) and Wood (1950) that the coagulation time should be prolonged to between two to three times the normal. This can be achieved by keeping the level before each dose at about twice the patient's normal (Fig. 3). Because of the longer action of intramuscular heparin, successive injections may summate if given too often, so that local reactions are increased.

A step-like progressive increase in levels was seen several times when the minimum coagulation times exceeded about 20 minutes (Fig. 4), and bleeding into the injection sites occurred. The results achieved with different dosage schedules (Tables II and III) show that, to maintain the minimum coagulation time at approximately twice the patient's normal, 150 mg. 12-hourly or 100 mg. 8-hourly was generally enough.

The greater effect of repeated injections of these doses compared with the isolated doses is due partly to the increase in heparin sensitivity which occurs with treatment (de Takats, 1943, 1950) and partly to the tendency to summation. Even with these doses, which are smaller than have been advocated by Abrahams (1950), excessive prolongation of the coagulation time was sometimes seen; the coagulation time should therefore be estimated every 24 hours, preferably just before an injection is due.

TABLE III.—*Results of Various Intramuscular Heparin Dosage Schedules*

Dose in mg.	Time Interval Between Doses	Effect on Coagulation Time*			Total
		No. of Cases Adequate	No. of Cases Inadequate	No. of Cases Excessive	
100	8 hours	6	1	2	9
100	12 ,,	2	0	0	2
125	8 ,,	7	0	2	9
150	12 ,,	14	2	2	18
150	8 ,,	0	1	3	4
250	12 ,,	0	0	3	3
250	24 ,,	0	4	0	4

* The criteria used for assessing the results on the coagulation times are explained in the text.

Indications for Intramuscular Heparin

There is evidence that intermittent intravenous injections of heparin are more effective than intramuscular heparin in the acute stages of a thrombotic process (Bauer *et al.*, 1950). Jorpes (1950) ascribed this difference to the effect of the transient high peaks of action seen with intravenous (but not with intramuscular) injections upon the loose newly formed clots. The vasodilator action of heparin (Abrahams and Howarth, 1950) may also be less after intramuscular injection. For these reasons heparin should be given, if possible, intravenously in the acute stage of a thrombo-embolic illness and intramuscularly only in the later stages.

Intramuscular heparin may prove a useful form of domiciliary treatment for patients with myocardial infarction who present themselves a week or more after the onset of the illness, when it is often difficult to secure their admission to a hospital for treatment with coumarin drugs. Further study is needed to determine whether the dose of heparin which can safely be given in this way will significantly reduce the incidence of the thrombo-embolic complications of this disease.

De Takats (1950) has found intramuscular heparin in doses of 50–150 mg. 12-hourly to be useful as a prophylactic measure against post-operative venous thrombosis and pulmonary embolism. This dosage may be inadequate for treating established thrombotic conditions because of the decreased heparin sensitivity which is commonly seen after operation. This was illustrated by one of our patients who developed a myocardial infarction after a partial gastrectomy: 100 mg. of heparin intramuscularly eight-hourly for eight days failed to prolong the minimum coagulation time above 10 minutes.

Contraindications to Intramuscular Heparin.—Patients with a tendency to bruise easily from minor injuries, especially elderly persons with loose inelastic connective tissues, and those with considerably raised venous pressure, are unsuitable for intramuscular heparin administration because they are very liable to develop local haematomata.

Summary

Thirty-seven patients with thrombo-embolic diseases have been treated with heparin alone for periods up to five weeks in order to ascertain if this is an efficient and safe alternative to coumarin drugs for prolonged anticoagulant therapy, in circumstances which preclude the daily estimation of prothrombin times.

Heparin was administered intravenously in nine cases by means of an indwelling needle or polythene catheter with a Gordh adapter attached, intramuscularly in 23 cases, using a concentrated aqueous solution containing 250 mg. of heparin per ml., and by both methods in five cases.

Estimations of the coagulation time were made by Quick's modification of the Lee-White method, and the dose of heparin was adjusted to maintain the minimum coagulation time at approximately twice the pre-heparin level. In most cases this could be achieved by 50–75 mg. four-hourly intravenously and 150 mg. 12-hourly intramuscularly.

Haematomata due to intramuscular administration occurred mainly when doses larger than 150 mg. were used; when injections were given more often than 12-hourly; if the minimum coagulation time was main-

tained above 20 minutes; if the patient tended to bruise easily or had a considerably raised venous pressure; and in elderly patients with lax inelastic subcutaneous tissues.

Local reactions were minimized by the use of an isotonic solution of heparin mixed with 1% procaine and by applying firm pressure over the injection site, but the development of haematomata prevented further administration of heparin in 25% of the cases.

Of the 37 cases 35 suffered no further thromboembolic incidents, one patient died after a clinically typical recurrent myocardial infarction, and another experienced a mild recurrent infarction despite adequate prolongation of the coagulation times.

We are grateful to Dr. R. Powell and to Evans Medical Supplies Ltd. for generous supplies of heparin (pularin) and for a grant to defray the expense of this work. We also wish to thank Professor J. McMichael and members of the staff of the Postgraduate Medical School for kindly referring some of the patients studied. Professor McMichael and Dr. C. L. Cope kindly gave advice on the preparation of the paper.

REFERENCES

Abrahams, D. G. (1950). *British Medical Journal*, 2, 1418.
—— and Howarth, S. (1950). *Brit. Heart J.*, 12, 429.
Allen, E. V., Barker, N. W., and Hines, E. A. (1947). *Peripheral Vascular Diseases*, p. 725. Saunders, Philadelphia.
Bauer, G., Boström, H., Jorpes, E., and Kallner, S. (1950). *Acta med. scand.*, 136, 188.
De Takats, G. (1943). *Surg. Gynec. Obstet.*, 77, 39.
—— (1950). *J. Amer. med. Ass.*, 142, 527.
Forrester, A. C. (1949). *Lancet*, 1, 1007.
Jorpes, J. E. (1946). *Heparin in the Treatment of Thrombosis*, 2nd ed. Oxford Univ. Press, London.
—— (1950). *Acta chir. scand.*, Suppl. 149.
MacFadyen, W. A. L. (1949). *British Medical Journal*, 2, 925.
Quick, A. J., Honorato, R., and Stefanini, M. (1948). *Blood*, 3, 1120.
Wood, P. (1950). *Diseases of the Heart and Circulation*, p. 454. Eyre & Spottiswoode, London.

MITRAL VALVE DISEASE IN THE LIGHT OF SURGICAL TREATMENT

BY

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Successful valvulotomy for mitral stenosis has increased the necessity for careful clinical assessment. Three questions require an answer in every case: How much stenosis, how much regurgitation, and how much myocardial damage are present?

Disease of the mitral valve has long been classified under the two headings "mitral regurgitation" and "mitral stenosis." For some years I personally have preferred to think of this condition more generally as "mitral disease," since there are few cases of mitral stenosis in which some regurgitation does not occur, and there are many cases of mitral regurgitation in which there is probably also a sufficient degree of stenosis to influence the physical signs.

Rheumatic Myocarditis

The disease is always rheumatic in origin. The rheumatic inflammatory process attacks the muscle as well as the valve cusps. Assessment of the degree of rheumatic activity is important, for the state of the heart muscle in a case of mitral disease is good or bad in proportion to injury done to it by the rheumatic process. This process may be active or quiescent. The rheumatic inflammation varies enormously in acuteness or chronicity; the younger the case the more active is the infection. Furthermore, some cases have a progressive course, while others become arrested at any stage of the disease. In a third group the process is at first slightly progressive, becoming arrested for a period of years, and then reverting to activity.

Subsidence of the activity of the disease at an early stage is responsible for those cases in which a valvular murmur is heard but in which the exercise tolerance is extremely good. I remember a miner who had come south during the war and who offered himself for military service. He had been active at the coal face until a few months previously, and on the day of the examination had no symptoms whatever. He had the typical physical signs of mitral stenosis—that is, a presystolic and diastolic murmur at the apex. A second case was that of a centre-forward of one of the best London amateur football clubs who had first-class exercise tolerance but physical signs similar to that of the other case. Here the process must have become arrested at a sufficiently early stage for the muscle to have escaped disease and for insufficient narrowing to have occurred to obstruct the normal blood flow. It is therefore important to try to estimate the extent of this inflammatory activity in each case. A history of recent sore throat or of joint pains, together with an increase in the sedimentation rate and white cell count, points to activity. Changes in the cardiogram may also be suggestive.

Rheumatic Valvulitis

Normally the mitral valve is closed efficiently by ventricular systole. In mitral stenosis the cusps themselves become thickened, shrunken, and adherent to one another down their free edges for a varying distance, and, furthermore, mural endocardial change may cause some shrinking of the valvular orifice itself. This process in the cusps is at first fibrotic, but in many cases calcification occurs in addition. The exact physical state is of importance to the surgeon, for the structure of the cusps will determine the ease or difficulty of separating them. The mitral cusps as viewed from above lie obliquely. If the mitral valve is regarded as a clock face, the two cusps are so placed that their edges when they meet would roughly take the line of 10 o'clock to 4 o'clock. The antero-medial cusp which covers the upper right face of the "clock" is of great importance, since as it projects down into the left ventricle it directs the blood flow from the ventricle towards the aorta. Should it become injured, not only will mitral regurgitation of a considerable extent occur but its influence on the proper direction of the blood as it leaves the ventricle will be correspondingly modified.

At first view one would think that the chief importance of valvulotomy for the treatment of mitral stenosis would be the enlargement of the mitral orifice. A second additional therapeutic consequence of a successful operation, however, is to free the cusps from one another. The resulting increased mobility may enable them to come together more perfectly with ventricular systole. The operation, therefore, not only alleviates the stenosis in such cases, but it may decrease the regurgitation which is so often present. Speaking still in terms of the mitral cusps, the performance of an operation by no means guarantees that the patient's heart will remain in good health, but it is probable that after the age of 30 recrudescence of an acute rheumatic valvulitis becomes less likely, and therefore perhaps that a second adhesion of the cusp edges, divided by operation, will be slower in developing.

Mitral Regurgitation

The two lesions—mitral regurgitation and mitral stenosis—should be considered separately, since the physical problems involved, as regards both the patient's cardiac efficiency and the possible help from surgery, are separate in the two conditions. In mitral regurgitation there is no narrowing of the mitral orifice, and the inflow of blood from the left auricle to the left ventricle is not lessened. The output to the systemic circulation is adequate for all purposes. The circulatory effect of mitral regurgitation is therefore almost negligible. The total output from the left ventricle,

however, is increased above normal. The chamber expels, first, the normal flow into the aorta, and, secondly, the amount of blood which is returned into the left auricle through the insufficient mitral valve. This means that in the course of time, and if the heart muscle is healthy, the left ventricle enlarges so as to accommodate the increased amount of blood, which roughly corresponds to the systemic requirements and the volume of blood regurgitated into the left auricle. Not only does compensatory dilatation thus occur but compensatory hypertrophy accompanies this. It is therefore clear that in a heart whose muscle is healthy the effect of mitral regurgitation will be to cause a proportionate dilatation and hypertrophy of the left ventricular muscle.

The effect on the left auricle in mitral regurgitation is also of interest, and attention should be paid to what happens during ventricular diastole, particularly in contrast to what occurs in mitral stenosis. During the diastolic phase of the cardiac cycle, in mitral regurgitation, the pressure in the left ventricle falls quickly and so does that in the left auricle, since there is no obstruction to the free egress of blood from this chamber. The auricular muscle, therefore, does not remain in a state of distension, and the arterioles present in its substance are satisfactorily filled during diastole by the coronary flow. The nutrition of the left auricle thus remains good. It may well be that this is one reason why in mitral regurgitation, with no stenosis and with a sound myocardium, auricular fibrillation is rare.

To sum up, it would seem that the only effects of mitral regurgitation upon the circulation are likely to be a harmless degree of left ventricular hypertrophy and dilatation, and a relatively harmless degree of left auricular and pulmonary artery distension during ventricular systole only. It is probably for this reason that some people have gone so far as to deny that mitral regurgitation occurs. Moreover, it causes few or no symptoms, and is rarely seen in the post-mortem room. If the latter argument is applied to such a condition as chicken-pox, the fallacy of the statement becomes obvious. There have, however, been cases of mitral regurgitation in which the patient's life has been cut short by intercurrent subacute bacterial endocarditis of the mitral valve, and they demonstrate that this lesion is by no means a rarity.

Mitral Stenosis

To apply the same sort of reasoning to the problem of mitral stenosis, one should start by stressing the truism that accurate thought must be associated with accurate terminology. Stenosis is not a vague name for a clinical condition but the word means "*narrowing*." Every organ or part of the body has a considerable reserve of function. This is as true of the valvular orifices of the heart as it is of the kidneys and liver, and, just as removal of a kidney for some surgical condition does not immediately portend renal failure, so some degree of cardiac valvular distortion by no means indicates any significant interference with the blood flow. If this premise is accepted it follows that some degree of narrowing of the mitral orifice will occur without any falling off of the patient's cardiac reserve.

On the other hand, the design of the normal heart so far as the shapes of the auricular and ventricular chambers are concerned, and in relation to the shape and size of the valve orifices, is the optimum to prevent friction occurring in the blood stream as it passes from left auricle to left ventricle. Therefore, any slight distortion of the valvular orifice is likely to produce eddies and vibrations in the blood stream which would show themselves as thrills and murmurs. This is probably the reason why auscultatory evidence suggesting mitral stenosis occurs in some individuals whose cardiac function is unimpaired. When this stage is passed and when the narrowing becomes more pronounced, certain changes must follow in the heart and in the circulation. With progressive stenosis the left ventricle receives less blood and consequently expels less per beat. Thus the effect of mitral stenosis on this chamber is that it has less to do. Therefore, if left ventricular enlargement is found in a patient who has mitral stenosis, the cause of the hypertrophy or dilatation must be sought in some other lesion, such as severe rheumatic myocarditis, aortic valve disease, hypertension, and perhaps pericardial adhesions.

While the left ventricle is receiving less blood the left auricle is expelling less and is thus becoming over-full. The mean interauricular pressure will rise as the stenosis progresses, and will persist even into auricular diastole. This pressure change during auricular diastole is of the greatest importance to the state of the nutrition of the auricular muscle. As the pressure in the substance of the auricular muscle remains raised for a progressively longer period the coronary blood flow into the auricular coronary branches and capillaries during diastole becomes less, and the nutrition of the muscle suffers. It is probably this persistent distension of the left auricle which predisposes the chamber so readily to auricular fibrillation in mitral stenosis.

As the auricular pressure becomes raised, so does that in the pulmonary circulation. The blood volume in the lungs is also simultaneously much increased, with some corresponding decrease in the systemic circulation. The pulmonary artery mean pressure is increased as time goes on from the normal figure of about 18 mm. Hg to 40, 50, 60, or even higher readings than this. Furthermore, this pulmonary artery pressure is further increased during exercise, as shown by cardiac catheterization during ergometer tests. The over-distension of the pulmonary circulation is responsible for the haemoptysis which is common in mitral stenosis. In some cases this bleeding may be a direct result of local hyperaemia alone, but in others it is founded upon the presence of pulmonary infarcts. A further consequence of pulmonary infarction, often small, is the development of pleural effusions. Such effusions are not as a rule blood-stained. Pulmonary hypertension is an inevitable consequence of mitral stenosis, and its degree corresponds to the degree of stenosis.

State of the Myocardium

The third and perhaps the most important factor in assessing the severity of chronic mitral disease is the presence or the extent of myocardial change. In the early stages, and to a lesser degree in later years, the heart muscle is the site of active rheumatic myocarditis. The myocardial degeneration so produced varies enormously from case to case. The change is scattered diffusely through both auricles and both ventricles. The acute myocarditis may be slight, insidious, and at first comparatively symptomless. But in more severe and acute attacks shortness of breath and orthopnoea are found. In later years, when the attacks of activity are minimal and perhaps unnoticed, the damage is sufficiently scattered and sufficiently slight not to manifest obvious heart failure.

A second important fact must be remembered in patients with mitral disease who enter the forties and fifties. In a certain percentage of such individuals there will inevitably develop the degree and the extent of vascular heart disease to which in any case they would have fallen victims; for previous acute rheumatism is no safeguard against subsequent arterial disease. Furthermore, as a matter of opinion rather than proof, I personally believe that secondary and unrelated myocardial degeneration is commoner in elderly patients who are suffering from heart disease due to thyrotoxicosis, syphilis, or rheumatism.

In any given case of mitral disease it is necessary to try to assess the extent of the myocardial change, whatever the origin. Speaking generally, the larger the heart the more extensive and severe is the myocardial disease. Mitral valvular disease which is well established and in which the heart is barely enlarged is probably causing symptoms almost entirely by virtue of the valvular defect. Mitral disease with a really large heart is in all probability causing symptoms more by the presence of myocardial disease and weakness than by the valvular lesion as such. In intermediate cases the assessment of the individual responsibility of these two factors becomes a matter of considerable difficulty.

Diagnosis of Mitral Stenosis

In order to decide whether narrowing of the mitral valve is responsible for symptoms in any given case attention should be focused upon certain points. As the mitral orifice becomes sufficiently narrowed the output of the left ventricle is bound to become less. And as the pulmonary circulation becomes more and more hyperaemic the volume of the systemic blood also becomes progressively less. It follows that during periods of physical exertion the brain and skeletal muscles cannot receive their full and normal quota of circulating blood, and the lungs become increasingly congested. Consequences are best evaluated by taking a really full history from a patient. This history should be focused upon trying to decide how much less exercise the patient can now take, and how much pulmonary congestion such exercise causes.

Specific answers should be obtained to such questions as "How far can you walk on the flat?"; "To what extent do hills cause you to stop or to become short of breath?"; "How many flights of stairs can you climb without stopping?"; "Do you still run for trains and buses?"; and other particular questions which may be related to the physical activities due to the patient's profession or occupation. In the case of a woman the questions would be "How many children have you had?"; "How old is the youngest?"; "Were you in any way upset as regards your heart at the time of the last pregnancy?" A further series of questions should attempt to elicit when each symptom first started, and how rapidly its severity has increased. The next question which is helpful is that which is related to the presence of orthopnoea. Most patients with significant mitral narrowing are orthopnoeic. This can easily be assessed by asking how many pillows the patient needs to sleep upon, and for how long this change in position has been necessary. Further points suggestive of pulmonary hypertension are cough which is worse on exertion, and past haemoptysis. The importance of a clear and detailed history cannot be too fully stressed.

On physical examination palpation may discover pulsation over the pulmonary area suggesting pulmonary artery distension, or pulsation in the epigastric notch from right ventricular hypertrophy. Mitral presystolic or diastolic murmurs will be heard at the apex, and perhaps the apical systolic murmur of mitral regurgitation. We as yet do not know enough about these murmurs to be able to deduce from them the amount of stenosis or the amount of regurgitation they may imply. The resting heart rate is apt to be helpful. If the heart rate is slow the stroke-volume of the left ventricle is likely to be good, because of adequate diastolic filling, and the extent of the mitral narrowing therefore is not great. The blood pressure is also worth considering, first, because many patients with severe mitral stenosis have rather a low than a high blood pressure, and, secondly, because it has been suggested that the presence of hypertension in mitral stenosis indicates a better prognosis: perhaps the levelling up of the two circulation pressures, systemic and pulmonary, gives a return to a more normal proportion as between the two. The presence of auricular fibrillation is an indication of a fairly advanced lesion.

X-ray screening is of great value. The size of the heart can be accurately measured not only for comparison with the normal figures for the height, weight, and age of the patient, but also so that an accurate comparison may be made at intervals of three months, six months, or whatever may be considered necessary. From this it is possible to deduce either that there is very little enlargement, and thus little myocardial disease, or that the heart is much enlarged and that therefore the extent of the myocardial disease is great. Moreover, in cases in which at the first examination the heart was fairly small, a measurable increase in heart size occurring rather rapidly will indicate the presence of increasing myocardial weakness. The usual radiological features of mitral disease are of course looked for: the increase in the size of the pulmonary conus, and the backward displacement of the auricles in the right oblique position as demonstrated by a barium swallow.

The pulmonary arteries should next be considered carefully. In mitral disease there is definite enlargement of the larger pulmonary vessels, which have a rather stumpy appearance somewhat reminiscent of pollarded trees. The general translucency of the pulmonary fields is also diminished in mitral disease. But on the radiological evidence alone it is not possible to be certain whether the lesion is one of almost pure mitral stenosis or whether the case is one of long-standing mitral valvulitis causing regurgitation with perhaps no narrowing of the valve at all. The size of the auricles gives no clue to the extent or type of the valvular lesion. Very great auricular enlargement occurs without mitral narrowing, and is probably caused by extensive myocarditis. Very great ventricular enlargement is no doubt due to the same cause.

The cardiogram will show the degree of right ventricular hypertrophy. Cardiac catheterization provides clear evidence of pulmonary hypertension. But the figures so obtained do not enable one to determine the extent of the mitral lesion or to assess the degrees of mitral regurgitation and mitral stenosis in any given case.

Conclusions

The three diagnostic problems in mitral disease are to determine whether mitral stenosis or narrowing is really present, whether, on the other hand, the lesion is chiefly that of mitral regurgitation, and whether there is significant myocardial change. The choice of case for valvulotomy depends upon the assessment of these three factors. The most suitable case would seem to be that in which mitral narrowing is definite, as shown by symptoms of pulmonary congestion and limitation of effort; in which mitral regurgitation is slight; and in which absence of much cardiac enlargement indicates that there is no serious evidence of myocardial disease. The age of the patient is also probably important, but less so than the other factors.

Recently a joint research team from the U.S. Army and the British Colonial Office has been studying the natural history of leptospirosis and scrub typhus in North Borneo, and incidentally has discovered a new substance for repelling terrestrial leeches, which the members report in *Nature*, April 19, p. 667. They point out that troops fighting in the Burmese and Indian jungles during the second world war found that the dimethyl phthalate (D.M.P.) issued as a repellant of insects (particularly mosquitoes) was also fairly effective in keeping off leeches. Unfortunately D.M.P. often stings or burns when applied to the skin, particularly if there are any cuts or scratches, and its contact with the conjunctiva or the urethral mucosa is not pleasant. The new discovery is also an insect-repellant, now becoming standard in the U.S. Army for impregnating clothing against mites, mosquitoes, and fleas, and is known as M-1960. It consists of equal parts of N-butyl acetanilide, 2-butyl-2-ethyl-1,3-propanediol, and benzyl benzoate in 10% "Tween 80," an emulsifier, and one gallon of this concentrate is enough for 28 uniforms. It was observed that the local natives, Dusuns, who went about barefoot, would soon each pick up as many as 15 or 20 leeches (*Haemadipsa zeylanica*) despite constant vigilance. Two natives given impregnated socks and trousers but ordinary Army shoes remained free of leeches for over half an hour, while two companions in shirts and shorts collected 30 leeches each on their bare legs. One Dusun wore trousers only one leg of which had been impregnated, and similarly one treated and one normal sock. In 15 minutes the treated side was still free, while the untreated trouser leg had 18 leeches on it.

CHRONIC MERCURY POISONING IN LATENT FINGER-PRINT DEVELOPMENT

BY

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That mercury is a highly toxic substance, whether in the form of the pure metal or in combination with an acid radical, has been known from the earliest times, certainly from the days of ancient Rome. Mercury poisoning was first noticed in quicksilver miners, then in gilders, and at the present day there are at least 80 industries in which mercury is used and in which it may be a potential danger to the workmen (Dublin and Vane, 1933). The history of industrial mercurialism and a review of the main industries concerned has been provided by Buckell and his colleagues (1946). It is superfluous to cover this ground again. To this list, however, there has recently been added another occupation which seems to carry a hazard of chronic mercury poisoning—namely, that of police finger-print expert.

An outbreak of chronic mercurialism in the Lancashire County Constabulary Finger-print Department was reported by Agate and Buckell (1949). So far as we know, this is the only report of such an incident, and after reading their paper we decided to carry out the present investigation. Agate and Buckell found that of a staff of 32 men 7 exhibited tremor with or without other evidence of mercurialism. The substance responsible for the Lancashire outbreak was "grey powder" (hydrargyrum cum creta, *B.P.*), a preparation which is extensively used for the development of latent finger-prints. As it was known that the City of Sheffield Police Photographic Department had for years used the same powder, it was decided to inquire into the health of the members of that department.

The Sheffield City Police Photographic Department is staffed by four men. In addition, one man who was transferred to another branch of the service five years ago was included in the inquiry.

TABLE I

Case No.	Length of Service in Photographic Department	Estimated Daily Exposure
1	12·0 years	1·0 hour
2	13·5 "	0·5 "
3	3·5 "	0·5 "
4	5·0 "	1·0 "
5	3·5 "	0·5 "

Table I shows the length of service of each individual in the department, and his estimate of the time spent each day exposed to the "grey powder" dust. For various reasons connected with staffing, Cases 1 and 2 have had to do more of this type of work than the other three men, but it would appear that the annual estimated exposures have varied between 175 hours and 350 hours, approximately.

Clinical Histories

Case 1.—Since 1945 this man has had vague dyspepsia, and since 1946 depression. In the spring of 1948 he first noticed attacks of sudden sharp pain in the left ankle with momentary weakness in the joint. These attacks occurred at irregular intervals—sometimes twice daily and at other times not once a month at first—but at the beginning of 1949 they became more frequent. The pain was most often experienced on coming down stairs. Since 1947 he has felt abnormally tired at the end of a day's work and has become very irritable. Early in 1949 he noticed that his legs were becoming weak, the left one more than the right. About this time he had an attack of "influenza," and after this the condition got rapidly worse. He developed dyspnoea on exertion and sudden loss of balance when turning round or getting up from a chair. In May, 1949, he was unable to work because of giddiness, which lasted a week. He was admitted to hospital for investigation, and while there the condition was diagnosed as peripheral neuritis of unknown aetiology. The neurologist now agrees that chronic mercury poisoning adequately accounts for all his symptoms. In addition, this man has noticed excessive perspiration of the face in the absence of exertion, a feeling of tremulousness but no actual tremor for 12 months, a tendency to drop things, and slight weakness in the arms. He has experienced no salivation, gingivitis, or sleeplessness, and no tremor was found clinically.

Case 2.—This man was transferred from the photographic department six years ago, after serving there for 13.5 years. When he had been doing finger-print work for 7.5 years he noticed slight tremor of the hands, which has improved since he left the department. A year later his handwriting became shaky. He could write a few words well and then the writing deteriorated. This condition also has improved, but has not entirely disappeared. He was not affected in any other way in spite of being exposed to the risk over a considerable period—in fact, longer than Case 1. This may be due to the fact that, though he did not appreciate that there was any danger inherent in the use of the powder, he admits he used it sparingly and did not indulge in indiscriminate dusting. The desirability of this was brought home to him by the experience of a householder complaining that her wedding-ring had been damaged by the powder. This economy in the use of the powder is borne out by the fact that while this man served in the department the bulk of powder used was approximately 1 lb. (450 g.) in six months, as against 1 lb. (450 g.) a month in recent years.

Case 3.—This man had no signs or symptoms.

Case 4.—This man has noticed that during the past 18 months he has had slight tremor, that he perspires more readily than previously, and that he is more easily upset by difficult situations than formerly. No abnormality was noticed clinically.

Case 5.—This man had no signs or symptoms.

Comment on Cases.—From a review of these five men it seems that two were quite unaffected, two others had minor deviations from normal health which could have been due to mild chronic mercurialism, and the fifth developed peripheral neuritis which was accompanied by other symptoms commonly found in cases of chronic mercury poisoning. It seems not unreasonable to conclude that the illness in Case 1 was due to mercury, and that the minor illnesses, if they can be called that, in Cases 2 and 4 may have been due to the same cause.

The Powder

The "grey powder" used is obtained in 2-lb. (900-g.) tins from a local pharmacist. He in turn obtains it already prepared from a firm of wholesale manufacturing chemists. The powder is supplied in ordinary tins, and it is impossible to discover the time interval between its preparation and its use by the photographers. Since 1944 the powder has been used at the rate of 27 lb. (12.2 kg.) in 29 months, or approximately 1 lb. (450 g.) each month. Before that date it was

obtained freshly prepared from a local pharmacist 1 lb. (450 g.) at a time, and this quantity lasted six months. When dusting is in progress the powder is in an open container and is applied with a brush to the surface in question. The face of the operator is within about 12 in. (30 cm.) of the surface while the work is going on.

Method of Absorption

Mercury may be absorbed from the alimentary canal, through the lungs, or through the skin. Agate and Buckell (1949) favour the view that the route of absorption in such cases is probably by inhalation of fine dust, with the possibility that mercury vapour might be inhaled from the powder left lying about. They also envisage, as a possibility, direct absorption through the skin or by the mouth. In an effort to try to clarify this point, dust counts were made while dusting was in progress. A room was chosen in which the powder had not previously been used, and the Owens jet dust counter was employed to obtain samples of the airborne dust in the region of the operator's breathing level, before, during, and after the application of the powder to various surfaces in the room. The results are shown in Table II. It was hoped that during the counting it would

TABLE II.—*Results of Dust Count (Samples Counted at Magnification of 1,600 Diameters)*

No.	Operation	Concentration (Particles per c.cm.)
1	General atmosphere of room before dusting	1,660
2	" " "	1,820
3	During dusting of table	5,640
4	" " "	5,140
5	During dusting of mantelpiece	6,970
6	" " "	6,300
7	During dusting of door "	8,600
8	" " "	5,300
9	During dusting of lamp	7,630
10	" " "	7,470
11	During dusting of window	8,960
12	" " "	6,140
13	General atmosphere 10 minutes after dusting	3,320
14	As above after 15 minutes	2,320
15	" " " 20 "	2,980

be possible to make some distinction between mercury and other particles, and so obtain an estimate of the mercury content of the samples. A microscopical examination of a sample of the powder showed the presence of a proportion of mercury globules less than five microns in diameter. However, in the sample from the air it was found impossible to identify, positively, the mercury globules, and in fact no recognizable mercury particles were seen in any of the samples.

The counts do show a marked increase in the dust concentration near the operator, and the apparent absence of mercury particles may be due to shattering as they impinge at high velocity on to the instrument's collecting surface. Alternatively, owing to their high density the particles may rapidly fall below breathing level and out of the range of the instrument's intake. If this is so, then the presumption would be justified that the risk to the operator is not from the particles breathed but must arise from absorption through the skin, or, more likely, from contamination of the hands and accidental ingestion.

To follow this line of investigation further, it was decided to try to detect the mercury chemically by filtering the air breathed by the operator and analysing the deposit on the mask. To this end, arrangements were made for the photographers to wear a Martindale protective mask while searching for finger-prints following a burglary. In the light of the dust content of the air found, it was calculated that, in order to get enough mercury on the filter of the mask to identify chemically, it would be necessary for the operator to wear the mask for a total dusting time of at least 12 hours. This part of the investigation was not practicable. The mask was found to be a nuisance, and it had a disturbing influence on the persons whose homes had been burgled. Even if the householders were reassured that the powder would do no harm, and were told that the mask was being used for experimental purposes, they remained uneasy about the whole matter. For these reasons this part of the inquiry had to be abandoned.

The problem was then tackled from another angle. An air elutriator was used. This consisted of a vertical glass tube having its sides parallel over the upper part of its length, but tapering to a narrow inlet at the lower end. Samples consisting of 2 g. of the powder were placed in the bottom of the tube and air was blown, at a known linear velocity of flow, through the parallel portion of the tube. In preliminary experiments an attempt was made to filter the exit air, but this method was too insensitive. The method finally adopted was to suspend a horizontal glass plate near the top of the tube. It was found that, during a run, powder was deposited on this plate, which could then be removed and examined microscopically. For the latter purpose it was convenient to use an immersion liquid—nitrobenzene—which rendered the calcium carbonate particles transparent so that they could be easily differentiated from the mercury. The results are shown in Table III. While the maximum sizes detected do not agree exactly with those calculated by Stokes's law, they are of the right order.

TABLE III

Air Velocity (cm./sec.)	Microscopical Findings
72·8	Mercury globules up to 0·002 mm. diameter seen
54·5	" " " " 0·001 " " "
45·5	No mercury detected
33·1	" " "

The conclusion from this examination would appear to be that detectable metallic mercury will settle out from air rather quickly. This supports the results obtained from the examination of dust samples taken while dusting for finger-prints was in progress, and indicates that the failure to find metallic mercury in the samples of dust was not due to shattering of the mercury globules on the instrument, but to the heavy mercury falling rapidly out of the sphere of operation. This suggests that inhalation of vapour and absorption of mercury through the skin are more likely causes of toxicity in finger-print experts.

Chemical Examination

It was thought desirable to inquire into the question of whether, as a result of keeping, the powder was undergoing some change which would make it more toxic. Three samples of "grey powder" were analysed. The first of these, which had been prepared according to the *British Pharmacopoeia* 1932 formula, was received in a 2-lb. (900-g.) tin which had been in use for some considerable time. Approximately ¼ lb. (225 g.) of the powder was left in the tin, the rest having been used. This was called B.P.32(1). Later two freshly prepared samples were received, one made according to the same formula described as B.P.32(2), and the other according to the modified formula of the *British Pharmacopoeia* 1948, which specifies that 1% dextrose be added to the mixture of mercury and chalk—B.P.48. The fresh samples were somewhat lighter in colour than the older sample. The difference in colour persisted even after all three samples had been kept a further nine months in sealed bottles.

A chemical analysis was carried out on B.P.32(1) in the "as-received" condition, the normal procedure of drying at 110° C. before analysis having to be omitted owing to loss of mercury by volatilization at this temperature. Assuming all the lime to be present as $CaCO_3$, the result of analysis was as follows:

Calcium carbonate ($CaCO_3$)	67·13%
Mercury (Hg)	32·60%
Silica (SiO_2)	0·47%

These figures are consistent with the formula laid down in the *B.P.* 1932, but otherwise they provide little significant

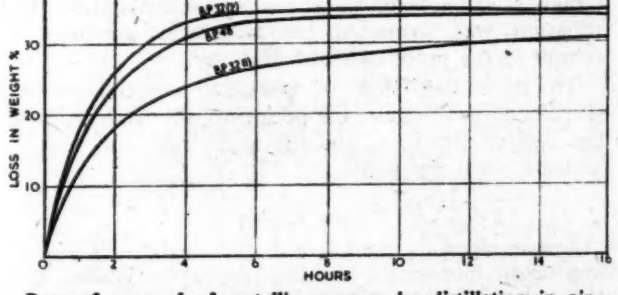
information. The silica reported would possibly be present as an impurity in the chalk. The powder was also tested for the presence of tin, which might have been picked up by amalgamation with the tin coating of the container. No detectable amount was, however, found. Tests also for alumina, iron, magnesia, etc., resulted in none being detected.

An attempt was made to determine the moisture content by drying over concentrated sulphuric acid at room temperature. A loss of weight of 0.09% was recorded after 24 hours. After four days this had increased to 0.39%. It seems likely, therefore, that a slow loss of mercury by volatilization was occurring even under these conditions. (In this connexion it may be noted that the vapour pressure of a liquid in the form of small globules is raised by the curvature of the surface over that of the bulk liquid.) Because of this it is not possible to give an accurate figure for moisture content, but the small amount of loss in 24 hours indicates that it must have been very low.

Since ordinary methods of analysis revealed no abnormal constituents, the indirect method was adopted of trying to detect significant differences of physical or chemical behaviour between the old sample and the freshly prepared ones.

Removal of Metallic Mercury by Distillation

An attempt was made to remove metallic mercury by distillation at low temperature, on the assumption that any mercury compounds which might have been formed would be less volatile than the free metal and might therefore be expected to remain in the residue after distillation was complete. Samples of the powders of the same initial weight were spread out on watch-glasses and placed in a thermostatically controlled oven, which was kept at 120° C. The weights of the samples were determined at intervals and the



Rate of removal of metallic mercury by distillation in air at 120° C.

weight losses plotted against time as shown in the Chart. It will be seen that the rate of loss from B.P.32(1) falls much below that of the other two. Three explanations of this behaviour are possible: (1) that a surface coating of some kind, preventing the free escape of vapour, was present on the globules of mercury in this sample; (2) that the globules of mercury in this sample were coarser than in the other two, or had become coarser on storage; or (3) that some of the mercury had been converted to a non-volatile form. Microscopical examination of the three samples proved inconclusive with regard to the second possibility. After 33 hours of heating, the weights of all three samples had apparently reached constancy, the weight losses then being:

B.P 32(1)	32·30%
B.P. 32(2)	33·97%
B.P. 48	33·23%

The residues were tested qualitatively for the presence of mercury, B.P.32(1) being found to contain a small amount while none was detected in the other two. This would seem to suggest that a small amount of non-volatile, and presumably combined, mercury was present in this sample. A "blank" test carried out on mercuric oxide gave a loss of only 0.18% in 45 hours at 120° C., confirming that combined mercury would be comparatively non-volatile at this temperature.

Extraction of "Water-soluble Mercury" from the Powders

When attempts were being made to extract any mercury compounds from the powders by means of weak reagents, the somewhat unexpected discovery was made that B.P.32(1) contained a small amount of mercury, presumably combined as a salt, which could be extracted by cold or hot water, the resulting solution giving a precipitate on passing hydrogen sulphide. No precipitate was obtained with the extracts from the other powders. An attempt was made to identify the acid radicals present in the solution from B.P.32(1), but this proved difficult owing to the small amount of material in the solution. A small quantity of sulphate was, however, detected. When the test for "water-soluble" mercury was repeated on all three samples some nine months later, during which time they had been kept in closed bottles, it was found that the cold-water extracts from both B.P.32(1) and B.P.32(2) now contained mercury. That from B.P.48 still gave no precipitate. The amounts of mercury present in the extracts were determined by weighing the precipitates. The results were as follows:

B.P. 32(1)	0·08% of mercury extracted (as Hg)
B.P. 32(2)	0·05% " " "
B.P. 48	Nil

It would therefore seem that the presence of dextrose was enough to prevent the formation of the soluble compound or compounds.

The method of Miss Roberts (1936) was also used to determine the amount of mercuric oxide in the samples. The results appear in Table IV.

TABLE IV.—*Amount of Mercury Present as HgO*

B.P. 32(1)	3·33% 3·57%
B.P. 32(2)	0·056% 0·056%
B.P. 48	0·08% 0·04%

These figures show that there is no direct proportionality between the "soluble mercury" and the mercuric oxide content. There is, however, probably some relationship between the two—for example, B.P. 32(1), which contained most mercuric oxide, also had the highest content of "soluble mercury."

Conclusions

"Grey powder" is the favourite substance used to develop latent finger-prints by all the police forces in this country. It has been so used for many years, and yet, till the report of Agate and Buckell, there has been no suggestion, so far as we know, that this process is dangerous. The clinical reports of Agate and Buckell and those detailed above show that, while the risk of toxic symptoms arising is real, it is nevertheless small. There seem to be two alternative possibilities to explain this: first, that of individual susceptibility, and, secondly, the amount of care which is taken in using the powder to avoid contamination of the air, clothes, skin, etc. If powder is scattered indiscriminately over any surface which might possibly bear a finger-print, instead of being applied only to those surfaces where a potential print can be seen, then obviously the risk of poisoning is increased.

This inquiry tends to show that the weight of evidence is against absorption by inhalation, in view of the speed with which the mercury globules fall out of the breathing area. This leaves open the possibilities that mercury vapour from spilled powder lying about in the workrooms may be inhaled, that the mercury may be absorbed through the skin, or that it may be accidentally ingested after contamination of the hands. In view of the fact that in many chemical and physical laboratories metallic mercury is left lying about in cracks in the floor and in other inaccessible regions with impunity, the likelihood that the inhalation of mercury

vapour is the answer seems small. The true answer may lie in a combination of absorption through the skin and accidental ingestion. If this is so, then, because of deterioration in the form of the production of water-soluble mercury compounds in the powder prepared according to the *B.P.* 1932 formula on keeping, this form of the powder should be much more dangerous than the new form (*B.P.* 1948), in which oxidation is inhibited by the addition of dextrose. Owing to the small quantity of these substances present, it has not been possible to identify the compounds completely, though traces of sulphate were found in the extracts. The presence of sulphate in the extract suggests that impurities such as mercuric sulphide in the mercury may also play a part in the reaction, possibly by inducing electrolytic couples in the metal.

The men concerned in this inquiry, and those in the cases reported by Agate and Buckell, had all been using "grey powder" to develop latent finger-prints long before 1948, when the addition of 1% dextrose was recommended to prevent oxidation of the finely divided mercury. It is interesting to speculate whether such cases would be likely to occur now or not. In view of the fact that soluble-mercury compounds are so much more dangerous than the pure metal, it seems to be a reasonable presumption that the risk would be slightly reduced.

Now that it is known that there is a risk in the procedure, the use of the powder must be discontinued until the method of absorption has been accurately determined, and means of preventing it have been devised. The alternative of elaborating some non-toxic, equally effective substitute emerges, but, up to date, "grey powder" still holds the field as the preparation of choice for the development of latent finger-prints.

Summary

The staff of a police photographic department has been investigated for signs of chronic mercury poisoning due to the use of "grey powder" in the development of latent finger-prints.

One case of peripheral neuritis, probably due to this cause, has been found in a staff of five men.

Experiments are described which tend to show that inhalation of the mercury dust is not the mode of absorption.

"Grey powder" made without the addition of dextrose tends to undergo oxidation, and water-soluble mercury compounds appear in the powder on storage.

We wish to acknowledge our indebtedness to Mr. W. A. Bloor, Senior Scientific Officer with the British Iron and Steel Research Association, who undertook the dust counts, and to Mr. George E. Scott, Chief Constable of the City of Sheffield; for permission to carry out the clinical side of this investigation among the men under his command.

REFERENCES

Agate, J. N., and Buckell, M. (1949). *Lancet*, 2, 451.
Buckell, M., *et al.* (1946). *Brit. J. Industr. Med.*, 3, 55.
Dublin, L. I., and Vane, R. J. (1933). Occupation Hazards and Diagnostic Signs Bulletin 582. U.S. Dept. of Labor, Bureau of Labor Statistics.
Roberts, I. (1936). *Quart. J. Pharm.*, 9, 684.

A note in *La Presse Médicale* of April 5 remarks on the numbers of Dutchmen who are leaving Holland as emigrants to various parts of the British Commonwealth or to the United States. In five years 56,478 persons left Holland: 11,872 went to Australia, 707 to New Zealand, Canada took 23,158 and South Africa 6,392, while the U.S. admitted 11,896. During the first six months of 1951, 9,000 more left for Canada and another 4,000 were waiting for transatlantic transport. The reason for this emigration lies in the smallness of Holland, which has to accommodate over 10 million people in a land which a hundred years ago only supported 3 million.

PILONIDAL SINUS OF THE AXILLA

BY

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Pilonidal sinus of the coccygeal region appears to have been first recorded by Anderson (1847), of Boston, who found hair in a sacro-coccygeal ulcer. A more typical case was reported, however, by Warren (1854). In 1880 Hodges gave a very complete description of the suppurative lesion of the nates and applied to it the name of pilonidal sinus. Hodges's paper is particularly interesting in that it made full reference to the occurrence of hair-containing sinuses in regions of the body outside the sacro-coccygeal area. He mentions, for example, that "hair cutters are continually in trouble from the short hairs which penetrate the skin of their fingers and hands," thus anticipating by more than 60 years the description of pilonidal sinus as it occurs in a barber's hand, furnished by Patey and Scarff (1946, 1948) and Ewing (1947). Hodges also mentions the frequent intrusion of hair from a mattress or mat into the sole of a bare foot. T. E. Smith (1948) has recorded the occurrence of pilonidal sinus anteriorly in the perineum. Suppuration related to buried hair may also occur at the umbilicus; at the meeting in Boston in 1854 of the Society for Medical Improvement, where Warren made his historic communication, a Dr. Jackson referred to a specimen of a "lock or pellet of hair taken from near the umbilicus"; and we have observed in this hospital a hirsute young female patient with recurrent umbilical suppuration in whom a pilonidal sinus in this situation was suspected but who was unwilling to submit to the proof of omphalectomy.

To these five sites of pilonidal suppuration—the sacro-coccygeal region, the perineum, the barber's hand, the sole of the foot, and the umbilicus—can now be added a sixth, the axilla.

Case Report

A man aged 34, dark-haired and abundantly but not abnormally hirsute, attended this hospital in October, 1949. He had a small sinus in the right axilla which had discharged intermittently for six months. There was a free discharge of pus from the sinus and some oedema around it. The appearance suggested tuberculosis, though the axillary lymph nodes were not enlarged; *Myco. tuberculosis* could not be demonstrated in the pus. The previous history obtained then from the patient included (1) a pleural effusion investigated elsewhere and considered not to be tuberculous, (2) an episode of supraspinatous tendinitis, and (3) a pilonidal sinus of the sacro-coccygeal region whose relevance was not appreciated at this stage.

In August, 1950, the patient was admitted to hospital for the treatment of continuing axillary suppuration, and an elliptical piece of skin was removed, with its long axis transversely across the axilla to include the openings of two sinuses. The incision was deepened into the subcutaneous tissue of the axilla and a block was removed to include the deeper portions of the sinuses, which extended to about 1 cm. under the skin. The skin wound was closed. Histological examination of the material removed showed very narrow openings lined by squamous epithelium leading to an irregular collapsed cavity with a partial wall of squamous epithelium and an abundance of granulation tissue. The histologist considered that excision had been incomplete on one side. The pus obtained at this operation showed a moderate number of pus cells, very few Gram-positive cocci,

and no acid-fast bacilli. Culture gave a scanty growth of *Staph. albus* resistant to penicillin. After this operation the wound broke down and further accessory sinuses developed, and suppuration was renewed in spite of intensive streptomycin therapy.

On June 7, 1951, a further unsuccessful attempt at excision of the inflamed area was undertaken; the histological pattern was the same as before, but this time with groups of giant cells suggesting a foreign-body reaction. On October 10 the clinical appearances of the axilla, with the scar of a previous operation, multiple discharging sinuses in its neighbourhood, and subcutaneous induration without lymph-node enlargement, seemed strikingly similar to the appearances usually presented by a pilonidal sinus in its usual sacro-coccygeal site. When expression was given to this similarity, the patient mentioned that during his military service he had in fact undergone two operations for pilonidal sinus, and reference to the notes afforded a record of this history, which had not been previously considered pertinent. A presumptive diagnosis was therefore made, on clinical grounds, of pilonidal sinus of the axilla.

On November 27 Mr. John Barron undertook a radical excision of the skin of the floor of the axilla with all connective tissue underlying it and with the whole area of axillary suppuration; the axillary vein was exposed. The resultant skin defect was repaired by an advancement flap. The wound healed by first intention and has remained healed since. The histological appearances confirmed the clinical diagnosis of pilonidal sinus of the axilla. Dr. C. V. Harrison reported as follows: "A piece of fatty tissue 100 by 70 by 10 mm. with attached skin was received. A small dimple was seen on the surface and a track was traced for 10 mm. A section was taken across the track; the latter lay between 1 and 2 mm. below the surface and was lined by granulation tissue. The cavity was of irregular shape and was packed with polymorphs and macrophages. Two hairs were found in the track, both surrounded by a foreign-body reaction. The appearances are those of a pilonidal sinus."

Comment

It seems clear that this patient suffered from a pilonidal sinus of the axilla, although it is not possible to say whether the axillary suppuration in his case was due originally to buried hair or whether the pilonidal effect has been consequent upon some down-growth of, or downward traction upon, hair-bearing axillary skin in the granulation tissue and scarring of an axillary suppuration due to some other cause. There are several points of interest that arise from consideration of the case history. The suspicion that a pilonidal sinus might be located in the axilla of this patient did not arise until after multiple operations had been undertaken, and the buried hair was not detected until a particular search for it was prompted by the presumptive clinical diagnosis. The possibility of a pilonidal effect in the axilla may perhaps usefully be borne in mind when patients present with intractable superficial inflammation in that situation.

The development of pilonidal suppuration in two different sites in the same patient suggests that anatomical abnormalities in the sacro-coccygeal region may not be the sole cause of the suppuration which occurs in that area. This patient, whether from a peculiarity of hair growth or of sweat-gland formation, or from some hormonal or metabolic disturbance which has not been revealed (and it is curious that most sufferers from sacro-coccygeal suppuration are male), has been liable to a down-growth of hair not only in the sacro-coccygeal region, where a congenital sinus may have encouraged it, but in the axilla, where there are no congenital sinuses larger than the apocrine glands. Hodges's original title of "pilonidal sinus" would still seem to be more desirable, even in the sacro-coccygeal region, than any anatomical or other titles that have subsequently been conferred upon this pathological picture.

Wide excision and plastic repair would seem to be the only suitable treatment for axillary suppuration of this character.

I am grateful to Dr. C. V. Harrison for his pathological reports, and to Mr. J. N. Barron for the details of the operation which he performed and for the plastic care which he gave this patient. I am also indebted to Mr. M. R. Ewing for drawing my attention to the excellence and comprehensiveness of R. M. Hodges's original paper.

REFERENCES

Anderson, A. W. (1847). *Boston med. surg. J.*, **36**, 74.
Ewing, M. R. (1947). *Lancet*, **1**, 427.
Hodges, R. M. (1880). *Boston med. surg. J.*, **103**, 485.
Patey, D. H., and Scarff, R. W. (1946). *Lancet*, **2**, 484.
—— —— (1948). Ibid., **2**, 13.
Smith, T. E. (1948). *J. Amer. med. Ass.*, **136**, 973.
Warren, J. M. (1854). *Amer. J. med. Sci.*, **28**, 113.

ACRYLIC REPLACEMENT AFTER SEGMENTAL RESECTION OF BONE

BY

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The accepted treatment of bone tumours, even those of moderate malignancy, is, whenever possible, amputation of the affected part. This report of three patients is concerned with the preservation of limbs disabled from disease by resection of the tumour-bearing segment and the subsequent restitution of the defect by the use of an internal prosthesis made of acrylic resin and steel.

Case 1. Osteoclastoma

A woman aged 20 sustained a pathological fracture of the right femoral neck on November 7, 1949 (Fig. 1). Curettage, packing the cavity with iliac-bone chips, and immobilization in plaster spica for 10 weeks produced no

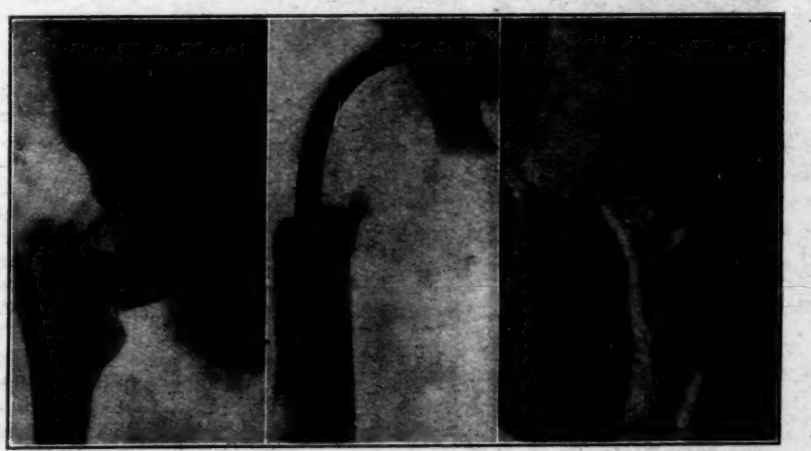

FIG. 1 FIG. 2 FIG. 3

FIG. 1.—Case 1. Radiolucent lesion in femoral neck with pathological fracture. FIG. 2.—Case 1. Twenty-two months after insertion the prosthesis has worked loose in femur. FIG. 3.—Case 2. Lytic lesion in trochanteric region.

success. Histology of curetted fragments confirmed osteoclastoma. On February 5, 1950, the femoral head, neck, trochanters, and 1 in. (2.5 cm.) of the shaft of the right femur were excised. On March 8 an acrylic prosthesis moulded round a steel bar of square cross-section was inserted after ramming the lower 4 in. (10 cm.) of the bar down the medullary cavity of the femoral shaft (J. M. P. C.). After eight weeks of immobilization on a Thomas splint walking was begun with the aid of crutches. On November 16 the patient returned to the work of a burler. In December, 1951, the limb was still painless and capable of full passive but not active hip movements and 50 degrees of knee flexion. The prosthesis, however, had worked loose in the femoral shaft (Fig. 2).

Case 2. Chondrosarcoma

A woman aged 31 had a fall in January, 1950, and complained of pain in the left knee and hip for the next 12 months. The radiographs showed a lytic lesion in the trochanteric region (Fig. 3) and the serum alkaline phosphatase was 94 units. On February 17, 1951, the tumour-bearing segment, together with a sleeve of muscle, was excised (Fig. 4). Leg length was maintained by skeletal traction through a tibial pin. On March 31 a prosthesis was inserted (Fig. 5) and the abductor muscles were moored to holes in the prosthesis (A. C. B.). After immobilization in a Thomas splint for six weeks non-weight-bearing active movements were started. On July 11 the patient left hospital wearing a weight-relieving calliper. The hip movements were painless and the serum alkaline phosphatase had fallen to 8.7 units. A radiograph taken on November 16 showed new bone formation round the prosthesis (Fig. 6). Passive hip movements are full; active movements, including abduction, are about half the normal range (Fig. 7). Knee flexion is 70 degrees. The patient is doing ordinary household duties and has no pain.

FIG. 4.—Case 2. The excised tumour-bearing segment, with a sleeve of muscle.

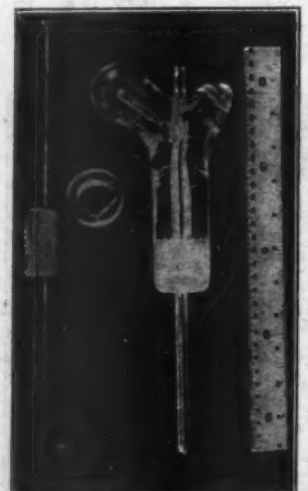

FIG. 5.—Case 2. The prosthesis. The male and female templates on the left were used to shape the bone to fit into a recess in the lower end of the prosthesis.

FIG. 6.—Case 2. New bone round the prosthesis 7½ months after its insertion.

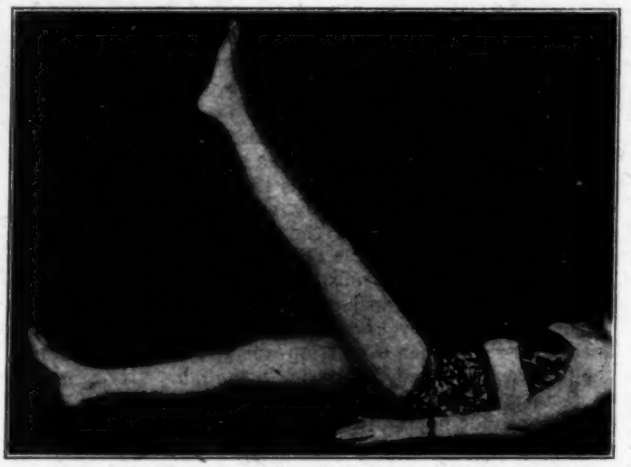

FIG. 7.—Case 2. Active hip flexion of 65 degrees.

Case 3. Osteochondroma

A youth aged 16 had a painless osteochondroma removed from the upper end of his left humerus in 1948. The tumour was reported malignant by two pathologists and benign by two others. In 1951 there was a local recurrence, which was painful and rubbed against the chest wall; the serum alkaline phosphatase was 14.9 units. On March 16, 1951, the upper half of the left humerus was excised, and on June 7 was replaced by a prosthesis (Fig. 8) (A. C. B.); the rotator cuff was stitched with fascia lata to holes in the tuberosity of the prosthesis and the subscapularis was stitched to the deltoid in front of the prosthesis. The arm was immobilized in a shoulder spica for six weeks. Movements were restored by a course of active exercises. On January 1, 1952, he began work as a baker. The left shoulder movements are painless and there is active abduction to 60 degrees. His left elbow, wrist, and hand are normal.

FIG. 8.—Case 3. Prosthesis six months after insertion, with new bone round its lower end.

Discussion

Segmental resection of bone tumours has been advocated by Coley and Higinbotham (1948, 1949). The procedure is applicable only to tumours of low malignancy which have not spread beyond the cortices of the bone. It may be advisable to remove a sleeve of muscle surrounding the bone in order to prevent dissemination of the tumour cells. No more effective extirpation of the neoplasm would be achieved by disarticulation at the hip or shoulder. The removal of regional lymph nodes by hind-quarter or fore-quarter amputations is unnecessary, as bone tumours do not usually spread by lymphatics. It is submitted that for endosteal tumours of low malignancy segmental resection is the method of choice because adequate removal of the tumour is feasible and the function of the limb can be restored by the use of an internal prosthesis.

Although resection and restitution have been performed in one operation, two stages are preferable, so that delivery of the prosthesis need not delay removal of the tumour and an accurately made prosthesis can be constructed from the resected bone. After a successful operation a satisfactory early result is to be expected, but the late results have still to be considered. The prosthesis in the first patient has already worked loose, and the correct treat-

ment for this complication has yet to be decided. In the other two patients the prosthesis is apparently wedded to the bone as a result of more rigid fixation, and it may be that the marriage will be a long and happy one.

Wholly metallic (Moore and Bohlman, 1943; Loomis, 1950) and wholly plastic prostheses similar to ours (Hudack, 1951; Scales, 1951) have proved satisfactory replacements for segments of bone, but the relative merits of the two materials have yet to be evaluated. A judicious combination of the two materials is best in order to achieve the optimum of lightness and strength.

Summary

Bone resection and replacement by internal prosthesis are advocated for endosteal tumours of low malignancy.

The early results in three cases are reported.

The relative merits of amputation and resection are discussed.

The first patient's prosthesis was made by the dental school of the University of Leeds, the prostheses of the second and third patients by Messrs. Down Bros. It is a pleasure to thank Professor T. Read, of the University of Leeds, and Mr. V. Carter, of Down Bros., for the help they have given us with the designing and construction of these prostheses. We also wish to thank Mr. J. E. Andrews and Miss Frances M. Ellis for the clinical photographs.

REFERENCES

Coley, B. L., and Higinbotham, N. L. (1948). *Ann. Surg.*, 127, 231.
—— (1949). *Cancer*, 2, 777.
Hudack, S. S. (1951). Ibid., 4, 823.
Loomis, L. K. (1950). *J. Bone Jt Surg.*, 32A, 944.
Moore, A. T., and Bohlman, H. R. (1943). Ibid., 25, 688.
Scales, J. T. (1951). Ibid., 33B, 463.

Medical Memoranda

Dermatitis after using "Pyrotenex"

The following case is recorded because the condition is new to me and because such cases are likely to occur with increasing frequency.

CASE REPORT

An electrician consulted me because of an irritation of his left forearm. He is a healthy man of 39 with no previous history of skin complaints.

On examination a patch of dermatitis 3 by 2 in. (7.5 by 5 cm.) was seen on the front of the left wrist. This had been extremely irritable for 24 hours. We found that the only new substance handled recently was an electrical conductor known as "pyrotenex." This conductor, I am informed, is becoming more frequently used, as it overcomes many of the technical difficulties met with in the more common and older electrical conductors. It consists of a copper tube tightly packed with glass fibre, with the wire running down the centre, the glass fibre being the insulating medium. It is flexible, heat-resisting, and any short-circuit would immediately go to earth through the copper tube. The patient had been using this medium for the first time 36 hours before the onset of his trouble.

On examining the lesion under a lens a minute spicule was seen protruding from one point. This was scraped off with a scalpel. A specimen of the insulating powder was now removed from the tube and examined under the microscope. It appeared in all ways to be similar to the spicule removed from the skin. A little of the powder was used for a patch test. After 36 hours there was no reaction when the adhesive plaster was removed in the morning. After a day at work, the patient came to see me again with an identical patch of dermatitis in the area used for the patch test. It appeared reasonable to presume that there was no reaction while the adhesive plaster immobilized the area, but that friction from the shirt on particles adhering to the skin quickly brought on an intense reaction. Careful washing, a soothing ointment, and the removal of the cause resulted in the complete disappearance of the lesion within 24 hours. I believe that the aggravating cause of his first lesion was friction from the shirt cuff.

It is suggested that men working with pyrotenex should do so with their sleeves rolled up to the elbow, that precautions be taken to prevent the powder from contaminating the clothes, and that special care be given to washing soon after contact.

CECIL W. WARD, M.B., Ch.B.

A Case of Meigs's Syndrome

In 1934 J. V. Meigs (quoted by Beaumont, 1950) drew attention to a striking condition in which an ovarian fibroma was associated with a pleural effusion and ascites. The pleural effusion (and ascites) cleared up and did not recur after removal of the ovarian tumour. Reviewing the subject, Beaumont states that up till 1944 only 30 cases had been recorded, 27 of these in America. In most cases the pleural effusion was on the right side.

Boyd (1950) states: "The nature of this rare condition is completely obscure, although a number of ingenious suggestions have been made in an attempt to explain how a benign ovarian tumour can cause pleural effusion." Two of the "ingenious" suggestions are: (1) That the pleural effusion is due to pressure on the azygos vein. The fact that pleural effusions are unknown in normal pregnancies, where the azygos vein is probably pressed upon to a greater extent, deprives this theory of any attractions it might have held. (2) That a persistent congenital pleuro-peritoneal channel might permit ascitic fluid to overflow into the chest, since ovarian fibromata, though benign, are known to be frequently associated with ascites. This theory is, however, not proved.

Until a satisfactory explanation is forthcoming to elucidate this mysterious association, cases of Meigs's syndrome such as the one described below will continue to be of interest.

CASE REPORT

A married woman of stout build aged 56 was admitted to hospital on April 4, 1951, complaining of lower abdominal pain of relatively sudden onset, duration 36 hours. She had vomited once, 12 hours before admission. There was no constipation or diarrhoea. She had noticed slight breathlessness on exertion in the preceding few weeks, and a slight unproductive cough was present. There had been no history of haemoptysis and no loss of weight. Fourteen years previously she had had an attack of pneumonia, and had also been operated on in 1945 for a strangulated femoral hernia. Otherwise her health had been quite good.

On examination she was of good colour and well nourished; her tongue was clean and moist. Her blood pressure was 140/80; temperature and pulse were normal. The abdomen was distended, partly by fat and partly by a rounded lower abdominal mass, reaching midway between the umbilicus and the pubis. Vaginal examination confirmed the impression of a large solid intra-abdominal tumour, arising from the pelvis. The heart sounds were normal. A small pleural effusion was detected at the base of the right pleural cavity. A blood count showed: red cells, 4,000,000; colour index, 0.9; white cells, 8,400 (neutrophils 75%, lymphocytes 22%, eosinophils 1%, basophils 1%, metamyelocytes 1%). E.S.R., 50 mm. in one hour (Westergren).

A diagnostic thoracentesis was performed on April 16 and 20 ml. of straw-coloured fluid was withdrawn. The pathological report was: "Cloudy yellow fluid containing a clot 1 cm. in diameter. Cells: 50% polymorphs, 50% lymphocytes. Ziehl-Neelsen's test, no acid-fast bacilli seen. Gram film, numerous pus cells. Cultures sterile." On May 4 a laparotomy was done (Mr. T. J. Cobbe) and a round pedunculated solid ovarian tumour 15 by 13 by 14 cm.

was removed. About 15 oz. (425 ml.) of slightly blood-tinged fluid was evacuated from the peritoneal cavity. There were no secondary deposits. The pathological report on the ovarian tumour stated that it was a myxofibroma. "The cell nuclei are small and angular, and in the myxomatous areas they are widely separated. The latter areas show irregular patches of haemorrhage. There is no sign of malignancy."

The patient made a good recovery, and, as she was anxious to leave the hospital, 7 oz. (200 ml.) of pleural fluid (this time blood-stained) was evacuated from the right pleural cavity. Before she left hospital on May 19 the radiologist confirmed that the fluid in the chest was much reduced. She was seen again on June 5, when the radiologist reported: "Lung fields clear now." Clinically she was symptomless and looked very well. On July 3 the radiological report was "Lung fields all clear." The patient, who had kept in good health, reported a gain in weight of 7½ lb. (3.4 kg.) since she left hospital. The E.S.R. was now 8 mm. (Westergren).

COMMENT

The possibility of other conditions—for example, primary or secondary neoplasm in the lung or pulmonary tuberculosis—coexisting with the ovarian myxofibroma was kept in mind. However, the failure of the pleural effusion to recur, the patient's gain in weight, coupled with her excellent clinical condition and the return of the E.S.R. to normal, appeared to rule these possibilities out of court, leaving the diagnosis of Meigs's syndrome undisputed.

I am grateful to Mr. T. J. Cobbe, surgeon, Royal Victoria Hospital, Dover, for his encouragement and for permission to report this case.

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Formerly Resident House-surgeon, Royal Victoria Hospital, Dover.

BIBLIOGRAPHY

Beaumont, G. E. (1950). *Applied Medicine*, p. 168. Churchill, London.
Boyd, W. (1950). *Pathology of Internal Diseases*, 5th ed., p. 257. Philadelphia.
Peel, J. H. (1950). *Textbook of Gynaecology*, 3rd ed., p. 272. Heinemann, London.

Repair of a Damaged Accessory Hepatic Duct by Anastomosis with the Cystic Duct

According to Flint (1923), the commonest cause of a leakage of bile following cholecystectomy is probably injury to an accessory hepatic duct and not, as is so often thought, slipping of the ligature around the cystic duct or a tear of the main bile-ducts. An accessory duct was present in about 15% of the 200 post-mortem specimens which he examined. They arose in the right lobe of the liver, lying at first posterior to the cystic duct, and joined the common hepatic duct at different levels. Flint recalled at least two occasions when he was confronted with the cut end of a duct which did not seem to fit in with the normal pattern, and referred to Moynihan as having had a similar experience.

This report concerns a case in which the damage to the accessory duct was not discovered until a week after the gall-bladder had been removed, by which time the abdominal cavity contained several pints of bile. Contrary to my usual custom, no drain was inserted, an omission which adds to the chastening effect of such a complication. Fortunately, the remnant of the cystic duct was long enough to bridge the gap and so redirect an appreciable flow of bile into its proper channel.

CASE REPORT

A housewife aged 51 was admitted to hospital on February 16, 1949, with cholelithiasis, from which she had suffered for the preceding six months. She had never been jaundiced, and, apart from a rather capricious appetite, was otherwise well. Cholecystography revealed the presence of numerous small stones in a functioning gall-bladder.

Cholecystectomy was performed under spinal anaesthesia on the day after admission. A right paramedian incision was chosen, and no difficulty was encountered during exposure of the gall-bladder. It had a slightly thickened wall and contained six small cholesterol stones. The cystic duct was readily identified, and was traced as far as its junction with the common duct. The cystic artery, however, could not be exposed to view: an aneurysm needle was therefore carefully passed through the fatty tissue lying behind the stump of the cystic duct and a ligature applied. After cutting across between the latter and distally applied forceps, no bleeding occurred, nor was there a noticeable escape of bile. In fact, the wound was so dry after the bed of the gall-bladder had been re-peritonized that it seemed safe to dispense with a drain. The other viscera that lay within reach were regarded as normal.

Post-operative Course.—Two days later the patient began to complain of vague generalized abdominal discomfort with occasional bouts of sickness. These symptoms were at first taken to be the natural sequelae of the operation, but when they persisted despite enemata, and particularly when a trace of jaundice appeared, it became obvious that something serious had gone wrong.

The wound was reopened on the seventh day. On opening the peritoneum a large quantity of bile flowed out. Owing to the altered state of the tissues it was not possible to make a clean dissection of the vital area, but eventually the common bile and hepatic ducts were exposed. The leak occurred from neither of them, but from a gaping duct which emerged from the liver at the extreme right of the porta hepatis. It had been cut across almost flush with the liver surface, and was about 3 to 4 mm. in diameter. The stump of the cystic duct happened to lie in the close vicinity and was long and wide enough to anastomose to the accessory duct. Accordingly, the catgut ligature was removed from the cystic duct and its patency checked. A T-tube was found that fitted comfortably into both ducts. These were brought together without tension with a single row of interrupted catgut sutures. The site of operation was also drained by a separate tube.

Bile continued to leak alongside as well as through the external limb of the T-tube for about 10 days. Thereafter it drained only through the tube in daily amounts of about 1 to 2 oz. (28 to 57 ml.). The T-tube was removed after four weeks. By that time the jaundice had completely cleared and the stools, which had previously been slightly pale, returned to a normal colour. The patient was discharged from hospital, after a stay of six weeks, in a satisfactory state of health. When seen a few months ago she had no complaints to make.

COMMENT

It is supposed that the distal end of the accessory hepatic duct was ligated along with the cystic artery, then cut across, and the proximal end left unattended. Flint and Moynihan simply tied the proximal end of such accessory ducts, with no apparent ill-effects. Walters (1924) described a method, for which he gave C. H. Mayo the credit, whereby the stump of the cystic duct is utilized to re-establish continuity. The calibre of the anomalous duct was the smaller of the two in their cases, but this difficulty was overcome by telescoping the one into the other, using catgut sutures. In the case reported, it was not only possible to accomplish an end-to-end approximation but also to employ an internal splint in the form of a T-tube. To have followed the modern preference of bringing the ducts together over a T-tube that has been inserted through a separate incision in the duct to be repaired (Cole *et al.*, 1949) would have meant opening the common bile duct, but this step was not necessary in the circumstances.

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REFERENCES

Cole, W. H., Reynolds, J. T., and Irenaeus, C., jun. (1949). *Advances in Surgery*, 1, 69. Interscience Publishers, Inc., New York.
Flint, E. R. (1923). *Brit. J. Surg.*, 10, 509.
Walters, W. (1924). *Ann. Surg.*, 79, 79.

Reviews

INTRODUCTION TO THE HEART

The Approach to Cardiology. By J. Crighton Bramwell, M.A., M.D., F.R.C.P. With foreword by A. V. Hill, C.H., O.B.E., Sc.D., F.R.S. Oxford Medical Publications. (Pp. 122; 66 figures. 17s. 6d.) London: Geoffrey Cumberlege (Oxford University Press). 1951.

To quote the opening sentence of this pleasing little book, "The transition from preclinical to clinical work is almost as sudden and as startling as that from chrysalis to butterfly." When the student emerges from the dusky laboratory (we are given a vivid impression of cellars, rats, blocked drains, and flaring gas burners by A. V. Hill's foreword) and first enters the ward, he tends to be bewildered by the strange environment, and cannot at first see how he may apply his recent learning. Dr. Crighton Bramwell has set out to still the trembling wings and to ensure that the first flaps shall be purposeful. He is well fitted for this task, for he has applied his own physiological researches to clinical medicine, particularly in respect of the pulse, and as a teacher and examiner he well knows the difficulties that students experience during the transition stage of their training.

The book is well written, clearly illustrated, and faultlessly printed. No deliberate attempt is made to impart factual knowledge or to cover any particular aspect of cardiology at all thoroughly; the subject-matter seems to be chosen according to its potential value in demonstrating the clinical application of certain physiological principles.

Although errors of fact may not matter as much as usual in a book of this kind, there are a few which would be better corrected. Thus it can no longer be maintained that the bump on the left border of the heart between the pulmonary arc and left ventricle seen in many cases of mitral stenosis is anything but the left atrium or its appendage, and it is curious that a photograph of the very specimen which may have led Sir John Parkinson astray on this point should have been borrowed from him and reproduced here (Fig. 10) to perpetuate the error (Fig. 11). In the same section the heart in Fallot's tetralogy is described as boot-shaped (Fig. 32) and rather like that in aortic incompetence (p. 31); the cœur-en-sabot has a tip-tilted toe, and in this respect resembles the shape of the wooden shoe worn by the Belgian and French peasantry. On pages 37 and 38 we are told that the first heart sound is produced by contraction of the ventricles; splitting of the first and second sound is not mentioned; "reduplicated" sounds are identified with "triple rhythm" due to the third or fourth sound; and the opening snap of mitral stenosis is given as an example (and the only example) of a pathological third heart sound. Finally, Lewis's circus-movement hypothesis is still put forward to explain the mechanism of auricular flutter and fibrillation despite Prinzmetal's devastating proof to the contrary.

As intimated above, however, objections of this kind do not seriously detract from the merits of the book, for the student who masters the principles of the approach is likely to benefit more than one content to absorb "facts." These principles are surely right, and the philosophy healthy—this is all that really matters.

PAUL WOOD.

MODERN GENETICS

The Genetics of Micro-Organisms. By D. G. Catcheside. (Pp. 223; 35 figures. £1 1s.) London: Sir Isaac Pitman. 1951.

During the 1930's the principles discovered by breeding the fly *Drosophila* came to be combined in a working system with the principles discovered by observing the chromosomes in plants. This working system is genetics. The achievement of the 1940's was to apply the new theory and the new techniques of genetics to microbes—fungi, algae, bacteria, and viruses.

Dr. Catcheside summarizes the results of this new epoch in biology. His book is concerned, as it must be, largely with the analysis of laboratory results. He explains the genetic, the chemical, and the mathematical foundations of the methods that are used, and it is unlikely that anyone could have done the job better. The subject, however, is a dry one and the treatment is so compact that the beginner will find it a little hard and unpalatable. When a new edition is brought forth (as indeed it is bound to be), we may hope that the author will do what many readers will do now—namely, put the general account of reproductive systems at the beginning. We may also hope that he will consign the nineteenth-century botanical terminology to the dustbin, where it belongs. He might at the same time loosen the text with even more of his excellent diagrams. He might also freshen it with more general biological discussion, including the genetics of disease resistance in animals and man, so well summarized recently in Dunn's *Genetics in the 20th Century.* The medical reader will then have a glimpse of the astonishing new outlook which genetics gives to the study of man's relation with disease.

C. D. DARLINGTON.

FOOD AND POPULATIONS

The Malthusian Controversy. By Kenneth Smith, M.Sc. (Econ.), B.Com., Ph.D. (Pp. 350. £1 10s.) London: Routledge and Kegan Paul. 1951.

The arbitrariness of scientific reputation is well brought out in Mr. Kenneth Smith's careful setting of the "Malthusian Theory" against the criticisms of Malthus's contemporaries and successors. The author shows that the arguments and facts which have been summarized under the name of Malthus are tied together more by fundamental class prejudices than by the structure of his argument. Few of his critics have denied the possibility of food supplies growing at a slower rate than the growth of human populations. They did dispute that the divergence between the two was inevitable. They disputed more fiercely the conclusions that Malthus drew from this assumed inevitability. If food is always to be a scarce blessing, who is to decide its dispensation? Malthus said that those already sitting at the feast had this power. Critics, such as Jarrold, gently suggested that perhaps it was not the prerogative of one guest to dismiss another from the hall.

Malthus's *Essay* came at an opportune time for those who had doubts about the social costs of the industrial revolution. A theory which saw in current social evils the working of a law of nature, which threw back on to the poor the onus of their poverty, which proved Poor Laws unnecessary and misery and disease useful, if not desirable—such a theory had obvious attractions in a period of agricultural depression, when prices were high and wages low. The theory was not, of course, well received by everyone. Apart from Godwin, against whose social radicalism Malthus had directed his *First Essay*, Hazlitt, Cobbett, and lesser publicists took up the cudgels against Malthus. Their struggle in print was never decisive. Malthus was attacked on the obvious but not always stated implications of his theory—implications of a social philosophy which remained constant though the form and the facts of theory changed with successive editions of the *Essay*—a narrow philosophy in which human nature was the whipping-boy for social evils and scientific pessimism the substitute for social action.

To-day the name of Malthus is associated less with the limited social outlook which impressed some of his contemporaries than with almost any problem of an expanding national population. It has become a symbol in discussions of the hunger of the populations of India and the Far East. The arguments, facts, and demonstrations of Malthus and his critics are now falling into a less controversial atmosphere. The new social sciences of demography, sociology,

and social medicine examine population problems, not in abstract argument, but in the context of our knowledge of social institutions and customs and of the differences in health and living standards of different classes and regions. The Welfare State makes use of this knowledge, both in planning food production and in maintaining the conditions which make parenthood possible and family life enjoyable. To-day it is the problem which Malthus and his supporters glossed over—that of the distribution of the means of life—which engages the attention of international and national agencies of human welfare.

S. A. SKLAROFF.

ATLAS OF MORBID ANATOMY

Atlas der Pathologischen Anatomie. By Dr. Robert Rössle and Dr. Kurt Apitz. (Pp. 298; 564 figures. M. 87.) Stuttgart: Georg Thieme.

Some thirty years ago I had the good fortune to visit Basle with a small group of London surgeons, and on a Saturday morning we were privileged to be present at a very remarkable demonstration. It was the custom on Saturday mornings for the whole medical staff of the hospital to meet, in strictest privacy, in the lecture theatre of the pathological department for a presentation by Professor Rössle of the whole pathological material of the previous week. All the material from operations and post-mortem examinations was neatly arranged on trays, and Professor Rössle gave a rapid description of each case, occasionally referring to one of his audience for some clinical detail.

This volume brings that scene vividly back to my mind, and I can give no better testimony to its quality than that after all these years I can see that wonderful array of specimens and hear the clear incisive remarks of the young professor. The whole volume is, indeed, an expansion of that scene, and we all may now share in the life's work of one who is now numbered among the greatest of German pathologists.

The whole field of morbid anatomy is covered by superb colour photographs of fresh specimens most skilfully displayed. Their technical perfection we owe to Kurt Apitz, who was killed in an air raid on Berlin in 1945, but many other blocks were lost irretrievably in an air raid on Leipzig. That in spite of all difficulties this great volume has been produced is a tribute to the courage and resource of Professor Rössle and his publishers. It is essentially an atlas, illustrating with great clarity and accuracy and in perfect colour the post-mortem appearance of the different organs under all possible conditions of abnormality and disease. The descriptions are brief and to the point, calling attention to the more important abnormalities in the specimens. It is impossible to imagine a work of greater technical perfection or of greater practical value, and Professor Rössle has earned the gratitude of all those who, whether as students or as teachers, are interested in the clear presentation of morbid anatomy.

HENRY SOUTTAR.

MATHEMATICS IN RADIOLOGY

A Students' Radiological Mathematics: Elementary Mathematics Applied to Medical Radiology. By L. A. W. Kemp, B.Sc., F.Inst.P. (Pp. 315. 21s.) Oxford: Blackwell Scientific Publications. 1951.

A highlight in the career of at least one teacher of radiological physics occurred when he found his students taking careful measurements on patients with a centimetre scale and carrying out dosage calculations with a slide-rule. This is not entirely surprising when one realizes the very small part which mathematics plays in the teaching and practice of most branches of clinical medicine. The situation in radiology is somewhat different in that a certain amount of physics, with its concomitant mathematics, is recognized as an essential part of the professional equipment of the radiologist and the radiographer. At the lowest estimate, qualifying examinations create a temporary need for these subjects.

Most teachers of radiologists and radiographers have longed for a sugar coating for the inevitable mathematics, and will be grateful to Mr. Kemp for undertaking the heroic task of presenting the elementary principles, if not with a sugar coating, at least with a radiological bias. The first half of the book is on such essentials as simple algebra, graphical methods, geometry, elementary trigonometry, and logarithms. To a physicist or mathematician the treatments will often seem long and laborious, but they are eminently clear and will be of great help to students, particularly since most of the illustrations and exercises are taken from everyday radiological problems.

The second half, though not difficult mathematically, is much stronger meat. Subjects such as logarithmic graph scales, the slide-rule and nomography, though of great importance and usefulness, are likely to find readers only among the more discerning or mathematically able radiologists and radiographers.

One general criticism must be made. For what is essentially a supplementary textbook, this volume is too long and bulky and there is a real danger that students, for whom it is so admirably written, may be frightened by its size. A useful purpose might even be served by its subdivision into a "Students' Radiological Mathematics" and a "Practitioners' Radiological Mathematics."

J. E. ROBERTS.

CATARACT

Die Trübungsformen der Menschlichen Linse. By Professor Hans Sautter. (Pp. 140; 191 illustrations. M. 49.80.) Stuttgart: Georg Thieme, 1951.

Sautter's *Cataract* is a brief survey of the different morphological types of opacification of the lens. The book is profusely illustrated to show the appearances with both the plane mirror and the slit-lamp. It makes no claim to originality in either the arrangement or the presentation, being based on the classical text of Vogt, which does not now seem to be readily available to the German-speaking ophthalmologist and senior student. Concisely presented, the book is a useful addition to the didactic literature, though to the English reader it merely duplicates the excellent chapters on the subject in Berliner's *Biomicroscopy of the Eye.*

ARNOLD SORSBY.

BIRMINGHAM STATISTICS

City of Birmingham Annual Abstract of Statistics. No. 1. 1931–1949. Edited by Richard Padley, Ph.D. Foreword by Enid Charles, Ph.D. (Pp. 140. 15s.) Birmingham: Central Statistical Office. 1951.

The City of Birmingham has made a bold move in compiling this abstract. Material has been drawn from many sources—corporation departments, Government publications, and elsewhere—and arranged in thirteen chapters on such topics as population, vital statistics, health, education, public services, employment, and industry. The abstract is intended as a reference work, and textual matter has therefore been deliberately restricted to a minimum. This policy reduces its value to those who are not directly concerned with Birmingham itself, though it is useful to know that all the information contained in this volume is available in the city's Central Statistical Office.

In this first volume historical series have been presented where possible, but otherwise the tables refer mainly to 1949, and subsequent issues will be annual. Special articles will present an analysis of selected topics: population, as it is fundamental to all studies, has been chosen as the subject in this first number. Though published before the tabulations of the 1951 census were available, the detail given is remarkable. The printing and format of the tabulations are commendable and must account for the comparatively high cost. The success of the venture will depend largely, however, on the special studies in which the statistics are interpreted and their practical significance shown.

J. KNOWELDEN.

BRITISH MEDICAL JOURNAL
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THE ETHICS OF LEUCOTOMY

In the last few months two studies[1 2] on the late results of frontal leucotomy performed on psychiatric patients have been published in this *Journal*. In addition there has been a lively correspondence on the ethics of carrying out this operation. The correspondents have referred to other articles[3 4] dealing with the effects of the operation on patients suffering, not from schizophrenia or other malignant psychotic disorders, but from neuroses and psychosomatic states such as asthma and anorexia. Some degree of uneasiness about the justifiability of the operation is widespread; and it is feared that recourse may be had to surgery, and mutilating operations be performed, when milder measures would be successful.

The objections which are raised are not solely on pragmatic grounds. One at least of our correspondents maintained the view that "the human being has the right to suffer, and even to commit suicide, with the brain, the somatic basis of the psyche, intact."[5] There are probably not very many medical men who would go so far as this. If the patient commits suicide, then the brain is destroyed in its entirety; and this would seem a high price to pay for the temporary preservation of a small part of it. We are led here to the confines of metaphysics. Churchmen have taken part in debates in lay journals, some of them taking the view that the soul is damaged by leucotomy, which should therefore be condemned on religious grounds. This has not been the attitude of Roman Catholics. In so far as the problem is a religious one, every medical man must come to a decision, on heart and conscience, for himself. One would not, however, have thought that the theological problem was a very difficult one. If the soul can survive death, it can surely survive leucotomy.

The problem in its medical aspects has to be considered in concrete terms. The consideration of leucotomy always offers a choice between evils. No responsible physician will recommend leucotomy unless he believes that the harm which is likely to be done by the operation will be outweighed by benefits which are not otherwise obtainable. He will therefore have to convince himself that all other practicable methods of treatment have been tried and have failed. It is not incumbent on him to demand the application of treatments which, although they have not so far been tried on this patient, he knows from experience would have a negligible chance of success. In fact, these grounds of exclusion are invariably fulfilled, both with neurotic and with psychotic patients.

The state of the patient's psyche, his mental health, can be assessed only in an objective way. There is no magical value in maintaining the physical intactness of the brain of a paranoid psychotic patient who paces his single room in the disturbed ward of a mental hospital in fury and despair for year after year. Whether the brain be intact or not, in such a case its function is grossly disturbed, and it is the duty of the doctor to restore function so far as it is in his power to do so. We are left, therefore, with the pragmatic question: What is the damage to mental health which can be expected after leucotomy, and how does it compare with the existing damage which will otherwise continue? Instead of thinking in terms of intactness of the brain we must consider the degree of happiness, of social efficiency, of power to appreciate and get the best from life, of kindness and affectionateness, of judgment and intellectual ability, which can be enjoyed by the patient or be restored to him if the operation be done or not be done. It is our duty as doctors to answer this question as well as we can to the patient and his relatives; and if we are unwilling to consider the question at all we should not object if advice is sought elsewhere.

The ponderables on one side of the balance cannot here be discussed at length: they vary too much from case to case. It is sufficient to say that the case of the chronic psychotic patient is dreadful indeed, and common humanity would justify an extreme measure if it offered hope. Neurotic patients are not often in such misery; but they may be, and sometimes the prospects of non-surgical treatment are as hopeless as in the chronic psychotic. While it is true that only the very exceptional and severe neurotic should come to operation, the operation should not be excluded on a diagnostic label alone. Some adherents of psycho-analysis maintain that this method of psychotherapy will always be successful with the neurotic patient. Objective evidence for this claim is lacking; and in practice whenever these more intractable neurotics are referred for psycho-analysis they are invariably rejected as unsuitable.

On the other side of the balance we have to weigh the damage which is likely to be done by the

[1] Baker, A. A., and Minski, L., *British Medical Journal*, 1951, **2**, 1239.
[2] Gillies, H., Hickson, B., and Mayer-Gross, W., ibid., 1952, **1**, 527.
[3] Steele, G. D. F., ibid., 1951, **2**, 84.
[4] Sargant, W., *Lancet*, 1951, **2**, 87.
[5] Winnicott, D. W., *British Medical Journal*, 1951, **2**, 496.
[6] Fulton, J. F., "The Frontal Lobes and Human Behaviour," Sherrington Lecture II, University of Liverpool, 1952.
[7] Rylander, G., Report to International Congress of Psychiatry, 1950, Paris.
[8] Le Beau, J., *J. ment. Sci.*, 1952, **98**, 12.

operation. The qualitative nature of this damage is well known. After operation patients may become more egoistic, tactless, dull, and lazy; they may be more irritable and quarrelsome; they may show lack of forethought and judgment. What is known only to those who have seen an extensive series of patients is the extent to which these undesirable changes actually occur. Exaggerated statements are sometimes made that the life of the leucotomized patient is reduced to that of a vegetable. This is not borne out by experience nor justified by the published results. Even with the standard operation the degree of impairment of personality is sometimes so slight that it can hardly be seen. In some other cases it is so severe that the latter state of the patient is worse than the first. Probabilities must be taken into account. In the psychotic patients reported on by Gillies, Hickson, and Mayer-Gross, 3% died as a result of the operation, 12% deteriorated, while 60% showed a greater or lesser degree of improvement.

It seems probable that the standard operation will in course of time be superseded by one or more modifications which will reduce the likelihood of noteworthy damage to the personality. The aid of experimental science is not lacking. According to Fulton,[6] whose careful work with baboons is a model of technique, the undesired intellectual impairment which may follow operation can be avoided by sparing certain pathways. When a frontal lesion involves projections from areas 9, 10, 11, and 12, the animal suffers impairment of his learning capacity but no disturbance in the emotional sphere. If the projections from the "visceral brain" only are interrupted, in the medial ventral quadrant of the frontal lobe, there are behavioural changes without loss of learning capacity. Even such a stern critic of the standard operation as Rylander[7] found that two-thirds of his 14 patients submitted to an inferior lobotomy were quite free from personality changes, though their symptoms were relieved or improved. Le Beau's[8] work on differential resections also suggests that with improvement in operative technique the good effects of surgery will eventually be secured without the deleterious ones.

The ill effects of the present methods of operating cannot but continue to be a great source of anxiety, not least to those who find it their duty on occasion to recommend surgery. That present procedures are so far from what we wish is no reason to give up hope of their improvement. The time will come when surgeons can act with greater knowledge and greater delicacy; and when it comes the ethical problems of operating on the brain for the relief of mental symptoms may well have faded into insignificance.

SURGERY OF ULCERATIVE COLITIS

Clinicians familiar with the vagaries of gastro-intestinal disease are always being reminded that human alimentary function is at the mercy of the emotions. Recently we commented on the experimental investigation of the mechanisms whereby emotional stress might set in train or aggravate ulcerative colitis.[1] Briefly, this work showed that the continued repression of anger, hostility, and resentment could induce colonic hyperfunction, as shown by hyperaemia, friability, increased motility, and augmented secretion of the mucolytic enzyme lysozyme, these changes sometimes progressing to submucosal petechial haemorrhages and ulceration. It may therefore seem inconsistent that in this week's issue Mr. W. B. Gabriel is able to put forward such good evidence in favour of surgical removal of the colon in the treatment of what some would regard as essentially a personality disorder. Yet there is nothing essentially illogical about this when we consider the use made of surgery in the treatment of gastro-duodenal ulceration, a condition in which psychic factors may play an equally prominent part. Properly applied, gastrectomy is one of the most satisfactory operations in the whole of surgery. It may indeed be an imperfect means of dealing with an imperfectly understood condition, but often it is the best treatment at present available.

The multiplicity of medical treatments already tried and found wanting in the treatment of chronic ulcerative colitis is in itself sufficient discouragement to the physician and temptation to the surgeon to proceed with more drastic methods. Few would quarrel with Mr. Gabriel's indications for operation: stricture formation, arthropathy, pyoderma, perforation, and multiple polyposis—a precarcinomatous condition—must all demand excision. Perhaps the commonest indication, "failure of medical treatment," is open to as much variation of interpretation as in the surgery of gastro-duodenal ulceration. It is on this point that some physicians and surgeons may differ, and the advice that final decision must be made by physician and surgeon in joint consultation cannot be too strongly endorsed.

In a refresher-course article in this *Journal* not long ago Dr. G. E. Beaumont[2] put the physician's point of view with characteristic clarity. While admitting the imperfections of medical treatment, he emphasized the benefits to be gained from rest, blood transfusion, chemotherapy and antibiotics, sedation,

[1] *British Medical Journal*, 1950, **2**, 449.
[2] Ibid., 950, **2**, 937
[3] Maingot, R., *Lancet*, 1942, **2**, 121.
[4] Corbett, R. S., *Ann. roy. Coll. Surg., Engl.*, 1952, **10**, 21.
[5] Rice-Oxley, J. M., and Truelove, S., *Lancet*, 1950, **1**, 663.
[6] Ibid., 1951, **2**, 462.

and general measures to improve the patient's nutrition, including vitamin supplements. The range of antibiotics continues to expand, and further advance may be expected. Polymethonium compounds, by their autonomic-ganglion blocking action, may yet prove rescuers of a bowel tossed in the storm of emotional stimuli acting through the parasympathetic system. The conclusion that medical treatment has failed is therefore not one to be lightly reached, though during such treatment careful watch must be kept for such rapid deterioration as shown radiologically in the second and third cases in Mr. Gabriel's series. The discomforts of ileostomy are not trivial, and, once performed, ileostomy is likely to be permanent, though exceptions have been reported,[3 4] particularly in cases where operation is undertaken early in the course of the disease. It is argued that early ileostomy may spare the colon from irreparable damage and allow the morbid process to settle down, with the result that normal function of the colon may be possible later. It may be that the outcome would be equally good in such early cases if medical treatment were begun forthwith. Without a controlled series in which alternate patients were treated medically and surgically no definite conclusions can be drawn. Nevertheless it is fairly generally agreed that the emergency or "last-ditch" ileostomy carries a high mortality[5] and is often a confession of tardiness as well as failure. Clearly then the predominant factor in determining the success or otherwise of surgical treatment is the careful selection of cases. Gabriel makes out a strong case in support of his contention that when a decision to operate is made inguinal ileostomy and total colectomy is the procedure of choice either as a one-stage or two-stage procedure.

In the management of ulcerative colitis early consultation between physician and surgeon, even at the stage before surgery is contemplated, will enable each to have a better understanding of the scope and limitation of the other's methods. A word of warning has been sounded by Brooke and Cooke,[6] who describe right-sided colitis in which involvement of the terminal ileum by the ulcerative process may lead to surgical failure. To avoid such disaster these authors advise that the preliminary examination should include a "progress meal" with non-flocculating colloidal material. Failure of fat absorption as shown by the fat balance test, macrocytic anaemia, serum protein disturbance, or glossitis provide further evidence of ileal dysfunction. The discovery of an ileal lesion is a contraindication to any operation designed to divert the faecal stream from the colon, since the disease may develop above the ileostomy.

SEPTIC ABORTION

The immediate complications of abortion may endanger life, and the remote effects may convert a woman into a "pelvic invalid" or render her subsequently sterile. These serious consequences are particularly associated with septic abortion, the treatment of which is discussed by Mr. C. W. F. Burnett in this issue of the *Journal*. It is to be hoped that he will publish a long-term study of his cases at a later date. His present paper is concerned with the management and immediate outcome of 267 consecutive cases of septic abortion seen at one hospital during the five years 1946 to 1950. The diagnosis in each case was made on clinical grounds, for without clinical signs of infection the recovery of pathogenic organisms from cervical swabs is not in itself diagnostic. Similarly, when infection is present, the predominant organism in the culture is not necessarily the infecting agent. This is particularly so in the case of *Cl. welchii*, which can be obtained in pure or mixed culture in about 20% of infections after abortion,[1] so that Mr. Burnett was fortunate to find this organism in only 4 of his 267 cases, a finding which helps to explain why apparently none of his cases was complicated by lower nephron nephrosis.

While some may differ on points of detail, the general lines of treatment which Mr. Burnett advocates in septic abortion will probably meet with wide approval, and his point that the best results are obtained if the infection can be quickly controlled before operation is a sound one: Davis[2] was not impressed with the sulphonamide drugs in combating infection in abortion, but the various antibiotic drugs are usually effective. Yet, if there is no response to whichever of these is given empirically at the outset, the evacuation of an incomplete septic abortion should not be delayed beyond 36 hours unless there is evidence that the infection is widespread. Evacuation of the uterus in these cases should be done by a skilled gynaecologist, and for this reason, and also because transfusions, blood cultures, and bacterial sensitivity tests are often required, patients with septic abortion should always be admitted to hospital, although preliminary attention at home by an obstetric flying-squad is sometimes life-saving. The hospitals for their part must see to it that enough beds are set aside for cases of abortion.

Although criminal abortion may not set up an infection, most, though not all, cases of septic abortion follow criminal interference. If, as has been reported, fewer cases of infected abortion are seen now in the United States because abortionists give an antibiotic drug before performing abortion,[3] the same may not be true in this country, where, according to Davis,[2] most criminal abortions are self-induced. Certain medico-legal points connected with criminal abortion were recently mentioned by Dr. Bentley Purchase[4] in a letter to this *Journal*, and in this issue these as well as the medico-legal aspect of therapeutic abortion are discussed by Dr. Donald Teare

[1] Ramsay, A. M., *J. Obstet. Gynaec. Brit. Emp.*, 1949, **56**, 247.
[2] *British Medical Journal*, 1950, **2**, 123.
[3] Greenhill, J. P., *Year Book of Obstetrics and Gynaecology*, 1950, Chicago p. 71.
[4] *British Medical Journal*, 1952, **1**, 761.

in a Refresher Course article. When the practitioner is consulted after an attempted abortion he has to consider both professional secrecy and public duty, and according to Dr. Teare there is rarely any difficulty in satisfying both. The first duty of the doctor is to the health and life of his patient. If he believes that the abortion was self-induced, then information gained in the professional relationship should not be disclosed, except on the rare occasion when it may be necessary in order to safeguard innocent persons from criminal allegations. When the doctor learns that another person is responsible for the abortion such information should generally not be disclosed without the patient's permission. Dr. Teare considers that in practice the question of taking a dying declaration very seldom arises. In certain circumstances, however, such as when the doctor believes that a professional abortionist has been at work, Dr. Teare believes that it is usually possible to pass information to the authorities without disclosing the particular patient's identity. But in the end it must remain with the conscience of the individual practitioner, guided by the profession's ethical standards, to decide when, if ever, professional secrecy must be subordinated to public duty.

IMMUNITY IN MUMPS

Clinical and serological evidence shows that many more than those who have had a recognizable attack of mumps are immune to this infection, and that immunity often follows a definite exposure although mumps is not diagnosable in the contact. The attack rate among those who have never had the disease is very low compared with the high rate for measles. In 31 epidemics of measles involving 1,774 boys, the attack rate on susceptibles was over 60% in thirteen outbreaks, whereas in seventeen outbreaks of mumps in which 687 boys were attacked the rate per hundred was 36 in one, 25.8 in another, and 17.5, 11.4, and 10.5 in three more; in the remaining twelve outbreaks the rate failed to reach 10%.[1] Knowledge of why this happens in mumps depends upon two serological tests, one the complement-fixation test and the other the intradermal test. In 1942 Enders and Cohen[2] showed that complement-fixing antibodies were present in convalescent serum of artificially infected monkeys. What was true for the monkey was found equally true for man by the experiments of Stokes and his colleagues,[3] who infected children possessing no complement-fixing antibodies by inoculating them with mumps virus from an infected monkey's gland. These developed typical mumps with the usual antibody response, and since then, as Enders[4] has stated, the test has proved of great usefulness in obscure cases, especially of acute aseptic lymphocytic meningo-encephalitis with or without parotid swelling. Henle and her colleagues[5] have recently reviewed the subject of susceptibility to mumps. In 1,853 skin tests results were positive in 56%, negative in 30%, and doubtful in 14%. Out of 995 subjects with a past history of mumps, 73% were positive and 15% negative; whereas out of 858 with no history 37% were positive and 47% negative (the results in the other subjects were doubtful). The complement-fixation test was performed on 1,561 individuals: 426 gave a past history and 299 of these (70%) had a positive test; whereas 1,135 gave a negative history and only 207 (18%) were positive. Among those with a negative history 27% of those over 18 years and 17% of those under 18 years had both a positive skin test and complement-fixing antibodies, which is evidence of previous inapparent infection.

The acid test of immunity is exposure to infection. In the population of 1,878 studied by Henle and her colleagues 140 cases of clinical mumps were recorded. Twelve (1.17%) occurred among 1,028 with a previous positive skin test, 13 (5.5%) among the doubtfuls, and 115 (18.7%) among the 614 with negative skin tests. Of 123 cases of mumps among 451 individuals in schools and institutions, 3 (1.45%) occurred among the 207 with a positive complement-fixation test, and 120 (49.3%) among the 244 sero-negative reactors. Mumps occasionally attacks the same person twice (for instance, 9 second attacks among 687 boys and 2 among 255 girls), and these figures of Henle show that, just as true mumps fails occasionally to give immunity, so inapparent mumps fails to do so considerably more often. To show that a lasting immunity usually results from an infection Enders and his colleagues[6] studied six groups of persons, mainly children in institutions, as soon as one or two cases of mumps appeared. Of 163 found to be positive to serological tests, and therefore presumably resistant, only one was attacked; whereas of 285 with no reaction 56 were attacked. All these observations show that immunity to mumps may be gained and usually maintained by a recognized attack, and that a lasting immunity also develops in a large number of persons as a result of inapparent infections.

CO-OPERATION IN THE HEALTH SERVICE

It was never expected that co-ordinating the work of the three branches of the Health Service would be easy, for the administrative barriers alone are discouraging. The areas of regional hospital boards, for instance, are unrelated to those of local health authorities or executive councils, and hospital management committees have no strictly defined geographical areas at all. Nevertheless, there have been efforts at co-operation all over the country, and a committee of the Central Health Services Council has remarked on a number of these in a report[1] which is mainly concerned with examining the general principles which should guide the administrators of the three branches of the Health Service in their efforts to achieve co-ordination. By a process of elimination the committee concluded that a possible solution to this problem lay in the establishment of joint health consultative committees, not at present at regional level but at the level of the individual local health authority, executive council, or hospital management committee.

[1] *Spec. Rep. Ser. med. Res. Coun., Lond.*, "Epidemics in Schools," No. 227, 1938, H.M.S.O., London.
[2] *Proc. Soc. exp. Biol.*, 1942, **50**, 180.
[3] *J. exp. Med.*, 1945, **81**, 93.
[4] *Harvey Lect.*, 1947–8 Series, **43**, 92.
[5] *J. Immunol.*, 1951, **66**, 535.
[6] *J. exp Med.*, 1946, **84**, 341.

[1] Central Health Services Council. Report on Co-operation between Hospital, Local Authority, and General Practitioner Services, 1952, H.M.S.O., London.

It is suggested that the area to be dealt with by each joint committee should be called a local health service area, and the report discusses in some detail the representation of the various local bodies on these committees. As a first step towards the establishment of joint health consultative committees it will probably be necessary to call regional conferences, one of the purposes of which will be to define the local health service areas within the region.

In putting forward the suggestion that local joint health consultative committees should be established, the committee frankly admits that it does not pretend to have found an ideal solution to the problem. One member of the committee in fact submitted a supplementary memorandum in which he states his conclusion that "such a mass creation of additional committees would, on balance, do more harm than good." This is perhaps too pessimistic a view, for the important thing is to bring together as often as possible those who administer the various branches of the Service, so that all are aware of each other's future plans and present problems. In fact, as the committee recognized, there is the greatest need for what it calls "*ad hoc* co-operation among officers." If this could be improved existing difficulties would be many fewer. It is a serious reflection on contemporary bureaucracy that the committee has had to look for other means of achieving co-operation "which will work where personalities are conflicting or where officers are so heavily engaged in discharge of the functions of their own authorities that they overlook the effect of their actions on others."

THE WORK OF W.H.O.

The third full year of activity of the World Health Organization is reported in a bulky volume of 200 large pages.[1] The Director-General, Dr. Brock Chisholm, speaks of a gradual but unmistakable development of world health consciousness. The right to health of under-privileged peoples is no longer left to a hopelessly small number of missionaries and other humanitarians to apply in practice: it is seen to be the duty of countries more richly endowed with resources and more skilled in their use and conservation to help the less developed to have the scientific and medical means of improvement.

W.H.O. has grown into an elaborate organization. Its active membership covers 69 States; 10 other States (Russia and other European countries behind the curtain, and China) are described as "inactive members." Japan, Spain, and Panama accepted or ratified the constitution in 1951. The Organization commands the service of advisory panels of experts in a wide range of subjects, from antibiotics to venereal infections, from nutrition to drugs of addiction. The total membership of these panels in 1951 was 871. Since 1947 the Organization has awarded 1,500 fellowships to officers in the health services of different countries, enabling them to receive advanced training abroad. The nationals of 73 countries were among the 655 men and women who received such fellowships last year. Another activity of the Organization is its programme of conferences. It arranged 37 of these, mostly at Geneva, in 1951, also 22 symposia, seminars, and teaching courses. The report describes field campaigns against malaria in a number of countries, research and other activities in connexion with various communicable diseases, and technical assistance in tuberculosis control. At the Tuberculosis Research Office in Copenhagen, maintained by W.H.O., much useful work is being done, particularly a study of mass B.C.G. vaccination. One of the most important achievements of the Fourth Assembly last year was the adoption of international sanitary regulations, and these are now being put into operation. The protection of isolated communities presents special difficulties, which are being investigated.

The epidemiological information service is becoming more important. As many as 7,000 messages, reports, and statistical bulletins are received annually, abstracted, and the required information distributed to national health administrations and quarantine officers all over the world. The report also contains details of the work in the six regional organizations. The regional offices are at widely different stages of development. In Africa the work is as yet hardly under way; in the Eastern Mediterranean it is in the course of planning; some work has been started in the West Pacific; and in South-east Asia the results of several years' preparatory work are beginning to bear fruit. In the Americas W.H.O. already has solid achievements to its credit, and in Europe much highly specialized work is continuing. The budget of W.H.O. runs to over $7.5m., of which the United States, the United Kingdom, and France contribute one-half.

A word should be said about the excellence of the production of the report, the readability of its matter, and the interest of its illustrations, though the absence of an index is a drawback. Like all international publications, it suffers from "initialitis": U.N.E.S.C.O. we know, and U.N.I.C.E.F. we are ready to accept, but here are a score of others, including U.N.R.W.A.P.R.N.E., C.C.I.C.M.S., W.F.U.N.A., and U.N.K.R.A.[2]

INCOME TAX AND SPENS

Many taxpayers who are professional men have a long-standing grievance against the Treasury. Medical men and women whose income consists in a salary are treated by the income-tax authorities with a severity unknown to their colleagues who obtain their income in fees. A doctor who subscribes to the B.M.A., a learned or specialist society, a defence society, and a library, who buys medical books, journals, and instruments, who runs a car, and who pays for professional telephone calls, can claim income-tax relief under his expenditure (with certain provisos) if he is assessed under Schedule D. The salaried doctor under Schedule E cannot claim for them unless they are "necessarily" incurred in the performance of the duties, which is usually construed as forbidding the allowance unless his employers specifically require the expenditure as a

[1] *The Work of W.H.O., 1951*, H.M.S.O., London.

[2] The U.N. Relief and Works Agency for Palestine Refugees in the Near East; the Council for the Co-ordination of International Congresses of Medical Science; the World Federation of United Nations Associations; and the U.N. Korean Reconstruction Agency.

condition of his employment. And in general they never do. As regards membership of the B.M.A., it is important that they should not, for it has always been the Association's policy—and this underlies the dispute with Durham County Council—that no doctor should be compelled to join the B.M.A. or any other professional organization or trade union.

The full-time hospital doctor is hard hit by this distinction. His need to belong to various societies and to replace instruments and outdated textbooks is just as great as that of his colleague practising on his own account. Such expenditure is essential to his professional efficiency, but in the view of High Court decisions is regarded as not allowable. The law must be taken as it is, but if the Spens recommendations for consultants are to be properly fulfilled the whole-time salaried doctor should not be at a disadvantage. The Spens Committee recommended that "all specialists engaged either whole-time or part-time in the Service should be paid, in addition to the remuneration recommended above [in the Report], any sums which represent expenses necessarily and reasonably incurred in the course of their work." And the Committee had evidence on various expenses "which must be met if the specialist is to perform his duties efficiently." These included "car expenses; expenses of travel apart from the use of a car; the cost of renewal of instruments and other equipment; the cost of books and journals, preparation of scientific papers, and subscriptions to professional societies; printing, stationery, postage, and telephone costs; expenses of attendance at national and international professional meetings; and the expenses of visiting hospitals and clinics at home and abroad, and entertaining visiting colleagues." There is little doubt that many of these expenses are not being adequately met at present. The Spens Committee suggested that they might be refunded after they had been incurred, or that appropriate expense allowances might be attached to the posts held by consultants and specialists. It is along these lines that the profession's representatives are negotiating through Whitley machinery for adequate payments. Fulfilment of the Spens recommendations should immediately do away with financial disparity between whole-time and part-time consultants in this respect and at the same time ensure that the expenses of both are properly met.

THE PURPOSE OF HOUSE APPOINTMENTS

Recent discussions of plans for a year of compulsory house appointments before medical registration have shown that many people in this country are unfamiliar with experience in America and Canada, where a large number of medical schools and licensing bodies require a year's internship before giving a degree or licence to practise. A monograph on the internship by Dr. R. L. Pullen[1] will therefore be of interest (though a price of 9s. 9d. for an essay of 7,500 words in a paper cover seems excessive even in these days of inflation). Although there are considerable differences in the organization of medical education and the staffing of hospitals in the U.S.A. and this country, the problems affecting house appointments are similar. Common factors are the demand for at least one year's house appointments before registration, compulsory military service, the up-grading of community hospitals, and the development of specialties. There are now more internships in the U.S.A. than medical graduates to fill the vacancies, but many of these internships are unsuitable for the recent graduate. Hospital practice is largely concerned with surgery, much of it nowadays of a highly specialized nature, whereas the work of the general practitioner is largely medical, some 50% of it mainly psychological. The recent increase in "residents" (registrars) has had the result that the house officer has become the forgotten man between the medical student and the resident, and his duties and responsibilities have been curtailed almost to vanishing point. This applies not only to the surgical specialties, in some of which the house officer may even find difficulty in getting into the operating theatre, but also to the medical departments of teaching hospitals with their numerous research staff. Certain specialties such as anaesthesia, radiology, and clinical pathology are already for practical purposes closed to the intern, and the specialties in general have become too numerous for him to move through them all in the course of one year. It would be unreasonable to demand two years of house appointments, particularly in view of compulsory military service.

There does not seem to be complete agreement about the purpose of the compulsory year's internship. "The rotating internship . . . provides for supervised experience in the major clinical divisions of internal medicine, surgery, obstetrics, and paediatrics, together with training in anaesthesiology, roentgenology, and pathology. The mixed internship offers training in two or more, but not all, of the major divisions. A straight internship is limited to supervised experience in a single major clinical division, including its related sub-specialties." If the internship is a preparation for general practice it should be a mixed or rotating service; if it is to be a preparation for a specialty, then a straight or special service will be preferred. If it is to be a period of further education—and this appears to be Dr. Pullen's hesitant choice—then it should take the form of a highly organized period of resident study.

Many will feel his choice a mistake. The medical student is already too long in leading-strings, and it is impossible for the universities to exercise the intimate control over the hospitals that would be demanded by this sort of programme. Whatever a man is going to do later, he will benefit from a mixed or rotating internship, and if there are too many jobs competing for too few interns it should be all the easier to limit the compulsory internship to the suitable jobs. Getting the work of the hospitals done and providing junior staff for the specialties is another problem. Some may question whether the recent multiplication of registrars and house officers in this country was the best way of doing this, and may think that there was something to be learned about methods of staffing from the old municipal hospitals as well as the teaching hospitals.

[1] *The Internship*, 1952, Oxford.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

MEDICO-LEGAL ASPECTS OF ABORTION

BY

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The Interdepartmental Committee on Abortion in 1939 estimated that between 110,000 and 150,000 abortions occurred annually in this country. If these cases sought medical advice, though many probably did not, it would appear that the average medical practitioner would see two or three cases of abortion every year.

The basic law about abortion is contained in the Offences Against the Person Act, 1861, and may be briefly summarized as follows: "... whosoever, with intent to procure the miscarriage of any woman, whether she be or not with child, shall unlawfully administer to her or cause to be taken by her any poison or other noxious thing, or shall unlawfully use any instrument or other means whatsoever with the like intent, shall be guilty of felony, and being convicted thereof shall be liable to be kept in penal servitude for life." The same law applies to the woman who attempts to procure her own miscarriage only when she is pregnant. A subsequent section in the Act deals with the supplying or procuring of poisons or instruments, which is in itself a misdemeanour, whether the woman be pregnant or not, providing that the intention is there. The use of the word "unlawfully" in this Act has led medical practitioners to believe that there is such a thing as the "lawful" use of an instrument.

Therapeutic Abortion

There are, therefore, two main medico-legal problems which may confront a medical practitioner. The first concerns his ethical behaviour towards so-called therapeutic abortion, and the second his professional and civil behaviour once an abortion or attempted abortion has taken place. It should be said at the outset, however, that there is evidence to suggest that 60% of the abortions which occur in this country and in the United States of America (the figures are virtually the same) are natural, or, at any rate, non-criminal events. In other words, the practitioner should not assume that every abortion is the result of some form of criminal interference. It has generally been thought that the only lawful justification for a therapeutic abortion is to save the life of the mother; this idea was greatly amplified in the case of *R.* v. *Bourne*, where the judge considered that it was the surgeon's duty to perform the operation of abortion if, on reasonable grounds and with adequate knowledge, he was of the opinion that the probable consequence of the continuation of pregnancy would be to make the patient a physical and mental wreck. The precise reasons or arguments for therapeutic abortion need not be gone into in detail here. They will depend greatly upon the individual, but briefly such conditions as advanced heart disease, chronic nephritis, and tuberculosis are the most common reasons put forward. Psychiatric reasons may be more difficult to substantiate, and ethical, economic, or social reasons have, at the moment, no support in law.

It is in relation to these last reasons that we must consider the question of the termination of pregnancy following maternal infection with rubella. In a recent leading article (*British Medical Journal*, 1951, 2, 592) a factual analysis of the material then available led the writer to the conclusion that if a woman has rubella during the first three months of her pregnancy there is a serious chance—perhaps 25%, perhaps over 80%—of her baby having one or more abnormalities, but these will not necessarily themselves be serious. From the available figures it would seem that the risks of congenital abnormality following maternal rubella are probably greater in Australia than in this country. Even taking the lower figure of a 25% incidence of congenital abnormality there seems to be some social argument for the termination of pregnancy in circumstances where further pregnancies are probable and not contraindicated. However, there can be no doubt that the strict interpretation of the law would make such termination illegal.

When a practitioner is consulted about the advisability of abortion, he must obviously take steps to safeguard his professional integrity. This can best be done by consultation with one or more practitioners, preferably specialists in the disease from which the patient is suffering. If their opinions support his views, then the emptying of the uterus should be performed as overtly as possible, preferably in a public hospital, and with the patient's and her husband's written consent. An eminent psychiatrist, who is not infrequently consulted about the advisability of therapeutic abortion on psychiatric grounds, informs me that in cases in which he advises the termination of pregnancy he charges no fee. He thus safeguards himself from any suggestion that he benefits financially from advising abortion. If a practitioner wishes to cast suspicion upon himself as an abortionist, he can do no worse than perform the operation or assist at the operation in an unlicensed nursing-home some distance from the woman's ordinary domicile and for a high fee.

Criminal Abortion

Much commoner than the problem of therapeutic abortion, however, are the cases in which the practitioner is consulted after the attempted abortion has been made. He now has to consider his code of professional secrecy, so far as the patient is concerned, and his civil duty to prevent the repetition of a felony. His first duty is, of course, to the health and life of his patient, but it is frequently of value in the treatment of patients suffering from the effects of abortion to know something of the aetiology of the condition. The chances of infection and other complications in abortion from natural causes are very much less than when an instrument has been used, and a knowledge that instrumentation is responsible will obviously put the practitioner on the look-out for the more dangerous complications.

In law a medical practitioner who has such reason to believe that an abortion has been criminally procured, whether by the patient herself or by another person, as to amount to knowledge of the fact, can be charged with misprision of felony if he does not report the matter. It is fair to add, however, that it is a good many years since anyone has been so accused. It is generally conceded and taught that if the abortion is thought to have been self-induced, and that the patient is likely to recover from the effects. then information gained in the professional relationship should not be disclosed. Little advantage is to be gained in the same circumstances if recovery is unlikely, from either the patient's point of view or that of the general public—unless it be to safeguard innocent persons from criminal allegation. Where information has been gained under circumstances of professional secrecy that another person is responsible for the abortion, such information should not be disclosed without the patient's permission. Here, however, the individual practitioner may feel very

differently, and particularly if he has reason to believe that a certain neighbourhood is being worked by an abortionist. Under such circumstances it is generally possible to inform the police authorities, without disclosing the particular patient's name, that such-and-such an abortionist is working in a given neighbourhood. In police jargon there is a popular expression—"acting on information received." Most responsible practitioners should be on such reasonable terms with the local police force as to be able to give such information without transgressing professional secrecy.

There are two extremes of thought on this vexed subject of professional secrecy: one held by the purist who will disclose nothing to authority, the other held by those who have seen the awful—the word is used in its strictest sense—mortality and morbidity resulting from the activities of the professional abortionist.

During the treatment of cases of abortion the question of taking a dying declaration or of instituting action leading to a magistrate's court in the hospital ward may have to be considered. To many people it will appear that it is no part of any doctor's treatment to agree with a patient that she is dying, however certain of that fact he may be in his own mind. Furthermore, a dying declaration not being subject to cross-examination is, in my experience—and in respect of abortion—not eventually given a great deal of weight by the justices. A magistrate's court on the other hand does not require the patient's acquiescence to the term "knowing that I am about to die," and her statement can be subject to cross-examination. Again, however, the patient's physical state is the prime consideration of the practitioner, and the occasions on which such a procedure can be carried through are few and far between.

Common Hazards

I have stated that probably more than half the abortions in this country are natural events; it must also be admitted that of the remainder a large proportion (in my own figures around 28% of fatal cases) are intentionally self-induced, while a small number (2% to 3%) are accidentally self-induced as the result of hygienic syringing. Furthermore, the methods which are used by professional abortionists, excluding the highly skilled medical abortionists, can be used by the woman herself, so that the method employed, if it can be diagnosed, does not give an indication of the person responsible. It may be said rather loosely that, the more severe the injuries to the vagina, the more likely is it that the attempt was self-induced, but the converse is not true, as is shown by the case of a married woman of 29 who lived in a prefabricated house with her 20-months-old son. Her husband was a serving soldier stationed on the coast.

Early one morning a neighbour heard the baby crying and later noticed that the child was still crying and that the bread and milk were still on her friend's doorstep. This neighbour managed to gain entrance to the house through the kitchenette window and found her friend in the lavatory, the door of which was wide open. She was sitting on the water-closet seat with her head thrown back, and on the arrival of the police surgeon was found to be dead. Death was thought to have occurred 12 hours previously. A chamber containing white fluid was found on the floor of the lavatory. The body was fully clothed except for knickers, which were found neatly folded on a chair in the living-room. Over the back of the chair was a pair of pyjamas, and it was subsequently ascertained that it was the deceased woman's habit to undress and dress in the living-room to avoid disturbing the baby in the bedroom. All the electric lights were on except that in the bedroom. An enema syringe, apparently recently used, was lying on the draining board of the scullery. The front and back doors of the house were bolted on the inside.

At the post-mortem examination there was no doubt that this woman had died of air embolism following the introduction of soapy fluid into the pregnant uterus. When the husband was interviewed, he stated that he was well aware of his wife's condition, that the baby was expected in July, and his wife was attending a local doctor for antenatal treatment and had made every reasonable preparation for the birth. All this proved to be true. He also stated that he had known his wife to use an enema syringe for vaginal douching, particularly in Egypt, where they were married.

It would appear, therefore, that this woman, on the night previously, was preparing to go to bed in the usual way and took with her to the lavatory an enema syringe and a bowl of diluted antiseptic solution. After douching herself, she walked to the kitchen (a matter of six or seven steps in this type of house) and laid the syringe on the draining-board. She was able to return and sit on the water-closet seat before the effect of the air embolism killed her.

Air embolism, shock due to vagal inhibition, sepsis—particularly anaerobic infection—and lower nephron-nephrosis are the commonest causes of death following abortion. The case cited above illustrates the following facts: the introduction of fluid into the pregnant uterus can be easily achieved by the woman herself; it may be so achieved accidentally; and a small amount of voluntary movement is possible afterwards. In this case the woman was capable of walking 15 to 20 paces before being overcome by the effects of air embolism. Circumstantial evidence in other cases supports the view that only the simplest voluntary movements are possible after the introduction of large quantities of air into the pregnant uterus. This restriction on activity before death makes the recognition of air embolism of great importance, since it implies that the attempted abortion was carried out in the immediate proximity of where the woman died. The observation of vagal inhibition is similarly of great forensic importance, but, being based on virtually negative findings, it is more difficult to recognize.

Sepsis, while not categorically implying instrumental interference, is strongly suggestive, particularly when the organism is an anaerobe. A full bacteriological examination of an infected abortion may help not only in the treatment and prognosis of the case but also in the identification of the cause.

Lower nephron nephrosis is much too large a subject to be dealt with here, but, briefly, it may be said to occur far from infrequently in cases of infected abortion, generally manifesting its presence by oliguria about eight to ten days after the onset of symptoms and often at a time when the patient seems to be out of the wood. It has accounted for 25% of the fatal cases which I have seen in the past five years.

Methods of Effecting Abortion

Of the instruments in common use, undoubtedly the ordinary enema syringe is the most popular, and generally the syringe is new and apparently freshly purchased for the specific purpose. The recently used syringe often smells of carbolic soap or an antiseptic, and the inside of the bulb takes some time to dry out after use.

Slippery elm bark is still available, and appears to carry a rather greater risk of infection.

A pregnant woman aged 20, who was engaged to be married, visited an abortionist in North London, who inserted a piece of slippery elm into the cervix at 6 o'clock one evening. The girl was desperately ill by noon the following day and died that evening. Her fiancé reported the matter to the police. The most significant features at necropsy were a bronzed cyanosis, presumably due to haemolysis, and extraordinary oedema of all the pelvic tissues including the uterus. Bacteriological examination gave a pure growth of *Clostridium oedematiens*, and a sample of slippery elm retrieved from the abortionist's house was subsequently examined and showed the same organism.

As might be expected, the most severe local damage is caused by sharp instruments such as knitting-needles, umbrella ribs, and the like.

A woman aged 29, engaged in a flourishing business, found herself pregnant after six months of married life. Her husband came home one evening to find her almost moribund and lying in a pool of blood in bed. She was immediately taken to hospital, where her condition was so serious as the result of haemorrhage that no extensive repair could ever be made of the severe lacerations which she admitted having caused in her vagina by means of a knitting-needle. She died some twenty hours after being found.

While drugs are undoubtedly extensively used (and easily obtained despite recent legislation) in the attempt to procure

abortion, it is very doubtful if they ever do more than effect a "trigger" action in a woman who will abort in any event, or more often give rise to a brisk attack of diarrhoea.

Conclusion

The lessons which may be learnt from a study of this wide problem are probably simple. The patient's life and health come first, and this should not be interfered with on the one hand by unnecessary questioning or, on the other, by delay in justifiable therapeutic abortion. The presence of a dangerous abortionist in a neighbourhood should be revealed to authority whenever possible without transgressing professional secrecy, and an open mind, free from bigotry, should be kept on the subject of therapeutic abortion, remembering that the law as well as medicine is progressive.

Next Refresher Course Article.—"Heart Block," by Dr. Geoffrey Bourne.

CLINICAL RESEARCH IN THE NATIONAL HEALTH SERVICE*

BY

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There is a great tendency for the medical profession and the laity to think that clinical research can be carried out only in hospital, where modern equipment is at hand and every aid to diagnosis is provided. But this is very far from the truth. Let us consider for a moment what is meant by clinical research. It is the painstaking investigation of individuals in the course of treating and caring for patients; it leads to an accumulation of knowledge which may be invaluable in the prevention and treatment of disease and in the maintenance of health. This knowledge may aid the advance of the practice of medicine in any of its many branches. It may confirm or refute established practice. It may point the way to new discovery or treatment.

The essence of clinical research is that it is carried out by a clinician—be he general practitioner or specialist—and it is research on the "human animal" during the course of his normal health or during illness.

The Past

In the past, practitioners of the various branches of medicine could be divided into three groups: (*a*) The humble and honest man who learnt his trade and then proceeded to apply what he had learnt. But he just applied it conscientiously and without thought; he never improved either himself or medicine as a whole. (*b*) The "quack" who plied his trade always with a view to his own advancement and with little care for the patient. (*c*) The true clinician, the man who studied his patients, their reactions to disease and treatment, who thought about his work, and who daily became a wiser and better doctor. If this last man kept records of his observations and as a result altered his treatments, improved his results, made original observations, etc., he was in fact a clinician carrying out clinical research on "human animals." We all know of such men in practice, and it is a great pity that their important observations are not handed down to future generations. It is only the general practitioner who has continuous access to his patients over many years and sees them in sickness and in health. He is their guide, philosopher, and friend who knows all their peculiar backgrounds and their habits. Such a doctor has far better opportunities for studying and recording the natural history of disease than any other medical man.

Great Names of the Past.—If we think back there are many names that come to our mind, all of whom have made many discoveries in the clinical field. To mention only a few: Hippocrates, Withering, Raynaud, Bright, Jenner, Addison, Hunter, Lister, and Mackenzie. What did they have, these "great names"? They had no *x*-ray films, no pathological laboratories, and not much in the way of diagnostic laparotomies. But they all had a natural and incurable curiosity, a capacity for hard work, a determination to keep detailed notes of their patients, the ability to observe big and little things which gave them clinical acumen, a healthy scepticism, and culture, and they lived in a more leisured and more slowly moving age.

The Present

What are the conditions prevailing with regard to the teaching of medical students who will become the practitioners of the future? It is good to be critical in these matters, as good may come out of them. Let us consider the present position of:

(*a*) *Professorial Units.*—Is everything being done to stimulate the student in clinical acumen? Is there not a tendency to promote abstruse research with a bias towards experimental detail? Teaching should be their forte, and they should teach the student to do his own clinical research on the patients. How many professors are true clinicians? Let us have research professors by all means, but in addition teaching professors who are clinicians engaged in the study of patients and their disease. How much are we missing to-day with the present over-specialization of professorial units or even of the average firm in a teaching hospital where the chief has a bias?

(*b*) *Hospitals.*—Not enough advantage is taken of the clinical material in hospitals, both teaching and non-teaching, and this is a great pity. In looking for the reason for this one is bound to admit that the records are so often poor because note-taking is so skimped. Also, frequently there are too many patients for the staff to deal with adequately.

(*c*) *General Practitioners.*—There are many reasons why general practitioners do practically no clinical research. First, they have to deal with too many patients, many of whom are not ill at all; and those that are really ill are taken away to the specialist. This means that the practitioner loses interest in his work and patients; it sometimes means that there is a gulf which may increase between the practitioner and the specialist. The practitioner is too often divorced from his local hospital. Again, the average practitioner has little or no time for leisure or facilities for study, and if he is on his own and takes a holiday it is not a "holiday with pay." He has to pay for his holiday, and he has also to pay the locum. This seems an anomaly.

Having considered the conditions which prevail at the present time, let us look at the future.

The Future

The Ingredients of Clinical Research

The Doctor.—(*a*) *Right Type*:—This is being forgotten to-day in the selection of medical students. It must be remembered that it is not usually the bookworm who makes the good doctor. It is often the footballer or cricketer, the good organizer, the man who lives and is human who will in the end be the better "type"—he who loves his fellow men. (*b*) *Right Training*:—It is essential that the training of medical students should develop their curiosity and their power of observation. Medical students who have not read *The Adventures of Sherlock Holmes* should be advised to

*Address delivered at the Third Annual (Public) Meeting of the United Sheffield Hospitals on April 17.

do so. The art of patience should be inculcated into every medical student, and it is important that the student should have a good basic knowledge and clinical acumen. Book knowledge is not enough; the practical side is important, and the teacher, whoever he be, must himself be a good clinician and teach by example rather than precept.

The Material.—There is no lack of clinical material in this country, although good use is not always made of it. The patients, young, middle-aged, and the aged, form the material. They may be seen at their homes, in institutions, in hospitals, in factories, or in the Services. This vast material will be of little avail unless adequate records of all details are made at the time of examination: these details may be of great value at a later date; these notes must be properly indexed and filed.

Facilities.—In a modern world where everything is being speeded up it is important that the practitioner should have time just to stop and think. He must not become an automaton or a slot-machine. In my opinion consultants should give better reports to general practitioners not only from the out-patient department but also after in-patient treatment, for by so doing the practitioner is kept abreast of modern therapy. Copies of pathological and *x*-ray reports should always be sent to practitioners, also necropsy reports so that interested doctors may be able to check their clinical findings. There must be the closest co-operation between the practitioner and the consultant. All facets of the patient's life are then brought into line—his job, home life, his diseases, his injuries, his "follow-up." It is essential that the practitioner can get an opinion without losing his patient. The practitioner should be able and have time to do the simple clinical tests. He should be able to get adequate *x*-ray films and pathological reports, to treat and study the patients whom he is capable of treating. He must, however, appreciate his own personal limitations. He must have adequate clerical staff and records, and these will probably be forthcoming when the health centres come into being. In some districts with very few hospital facilities health centres are an urgent necessity. A general practitioner working alone tends to become stale; discussions regarding patients with colleagues, general practitioners or specialists, are of great value. Group practice is the ideal form of practice in my opinion under this Health Service, for it allows discussions on patients, and there is a give and take and an added interest in the whole of medicine.

In hospitals the practitioner should have facilities for seeing his patients and for obtaining records of their progress and treatment. Practitioners should be encouraged to visit the operating theatres and see operations in progress, to see necropsies on their patients, and to attend clinical meetings. In my opinion the practitioners should play a more active, as opposed to passive, part than they do.

There is a very real place for the cottage hospital run by practitioners with consultant cover. These hospitals are doing excellent work and are filling a gap which would be difficult to supply from other sources. This is especially so in country districts where the population want to be treated in their local hospital and not be taken 20 miles away where their friends and relations do not have the time, money, or facilities to visit them.

Defects at Present

(*a*) Lack of time.—This is related to the financial stress of the individual. The practitioner is forced to "count heads" so that he can keep and educate his family as his predecessors have done for centuries. The State also comes into this picture, for it demands more work for fewer people, and the doctors with very large lists cannot possibly do justice to their individual patients.

(*b*) There is far too much time-devouring paper work, signing forms in triplicate, etc.—time better occupied in writing clinical notes or thinking, or in reading notes.

(*c*) Another great defect which must be remedied is the divorce of the general practitioner from hospitals and the loss of the doctor–patient relationship which results in the loss of the family doctor. It must be acknowledged that the old type of family doctor is becoming rare in towns with fluctuating populations, where families live only for a brief period and then move on.

(*d*) Inadequacy in the number of teaching beds in hospitals, mainly due to the growth of specialization; this stops the student from having adequate clinical experience while training. These teaching beds should be greatly increased so that the student may see the common and everyday type of case which will form the bulk of his cases in practice, and not the rare or special cases; these latter should be segregated to the postgraduate hospitals and not the undergraduate hospitals. The medical student is all too ready to learn about rare diseases and rare clinical cases, while he neglects the common diseases and conditions. Students should have more facilities for seeing emergency cases and emergency operations, as these are likely to occur in general practice. In every teaching hospital there should be at least five beds per student in general medicine and general surgery, and yet the figure is greatly below this in most hospitals that I have visited, and I have visited quite a number. In this mechanical age with fast-moving transport of every kind it is essential that the student should have a good grounding in the surgery of trauma, and this is best seen in the casualty departments of hospitals. It is here that he learns the treatment and management of the minor and major injuries. It might be a good thing for the future if every candidate for the Fellowship had to produce evidence of having done six months in casualty work. Senior registrars might also have to show that they had been in charge of the casualty-room at a recognized hospital for six months before qualifying for consultant status.

(*e*) Deficient and inadequate note-taking, especially case histories. This is all too prevalent except perhaps in the psychiatric departments of our hospitals. Adequate note-taking is the background of clinical knowledge, and once it is mastered clinical acumen comes to the fore.

Remedies

The Health Service has been in being for long enough for us to see its teething troubles and its defects. The remedies are:

(*a*) Less work for the doctor. This can be brought about by smaller "panel" lists. Institute payments for medicine so that unnecessary work may be cut out. Payment for apparatus will also act as a deterrent. There are far too many spectacles, artificial hearing-aids, and spare dentures which are not made use of at all by curious patients.

(*b*) Restore the status of the doctor so that he may take a pride in his work and not just be and feel a drudge, at the beck and call of everybody on his list.

(*c*) Provide adequate facilities for study without financial loss. Medicine is a progressive science; it does not stand still. New drugs and new forms of treatment are constantly appearing, and it is vitally necessary that the practitioner should be kept up to date. It is not sufficiently known that general practitioners can attend twenty-two sessions of approved postgraduate study each year. Expenses for the doctor and his locum (if necessary) are paid by the authorities.

(*d*) Increase teaching beds by using peripheral hospitals and by reducing specialist beds in teaching hospitals. Co-opt as teachers suitable people at the periphery; this will give them added incentive, and they will have an enormous volume of clinical material. Have constant interchange of registrars between the teaching hospitals and the non-teaching hospitals. Nothing but good can come of this interchange.

(*e*) Put the soul back into medicine. Change the name from the Health Service to something else. The name "service" is deadening, and it should be much more than a service.

(*f*) Decentralize so that local pride, so important for good work, may come back into medicine, so that the doctors once again become individuals and not units, and can think of their patients as human beings and not just as another number.

(*g*) Carry out a thorough and continuous "follow-up," for it is only by doing so that progress and knowledge may result.

Looking Forward

It is important to remember that ultimately all depends on the doctor. He must always remember that the patient is human. The doctor must be curious, keep up to date, be acutely observant, and at the same time be a healthy sceptic. He must think straight and keep his sense of proportion. He must behave as though medicine is a calling and not a "job." He must keep adequate and accurate records, and must have time to sit back and think at times.

The field is wide-flung—in fact, limitless. To mention only a few aspects in which all in the service can play a valuable part: (*a*) the study of the effects of drugs in the home, in the factory, and in the hospital; (*b*) the effects of operations—the immediate and the remote; (*c*) relation of treatment to rehabilitation in its widest sense; (*d*) the problem of geriatrics—this is likely to become more pronounced in the future, as the population as a whole will probably live longer; (*e*) the early diagnosis of cancer—this is a field of research which should appeal to most medical men, and the general practitioner has an important part to play in this ever-present problem; (*f*) domiciliary medicine, which must increase tremendously—this will prove of real value to the patient, practitioner, and specialist alike.

Conclusion

Clinical research is just as important as any other kind of research, and it does not always mean multiple laboratory investigations; but of course it can be and sometimes must be coupled with laboratory research.

Remember that observations must be accurate and they must be controlled; notes must be kept.

Much experience has been lost to medicine because doctors in the past have neglected to record their observations and pass them on.

Reports of Societies

PREFRONTAL LEUCOTOMY

VIEWS OF THE SCOTTISH ANALYTIC GROUP

At a recent meeting of the Scottish Analytic Group at which a number of neurosurgeons, neurologists, and psychiatrists were also present, Mr. J. SCHORSTEIN (neurosurgeon) opened a discussion on the ethics of prefrontal leucotomy.

Frequency of Leucotomy Rapidly Increasing

Originally the operation had been intended as a final attempt to alleviate the suffering of mental patients in asylums whose illness had affected them so badly that their life could scarcely be regarded as human any longer, who had proved unresponsive to other treatments, and whose prognosis was otherwise hopeless. However, since the operation had been accepted as a normal form of treatment a tendency to apply it much more widely had become evident. For example, in the United States the number of leucotomies performed had risen from approximately 275 between 1936 and 1941 to 1,725 in the next five years, 3,000 in the following 15 months, and 5,000 between June, 1948, and October, 1949. Freeman had reported that only 50% of the cases he operated on were hospitalized. In this country leucotomy had become a standard treatment for schizophrenia irrespective of whether the personality of the patient was completely distorted or not. Even in Scotland, where the treatment was generally applied only very conservatively, instances of leucotomy for homosexuality were known, and the operation was recommended for phobias or for preoccupation with discomforts and pains. That was alarming, because leucotomy caused in each patient a change in the personality and blunting of the moral qualities. It reduced the capacity for the abstract attitude in Goldstein's sense. The best result it could have was to restore the capacity for social and economic adjustment in a personality whose finer qualities had already been destroyed. This result was achieved in only 7.8% to 25% of the schizophrenic cases, whilst the rest were maimed even if some were more easily nursed after the operation.

Arguments Against Leucotomy

Much human suffering could be removed by blunting the human personality, but that ought not to be regarded as ethical medical treatment. It rested on a wrong attitude to suffering and the idea that we had to remove suffering whatever the cost. It viewed man as a machine and not as a moral individual. Many people felt an instinctive aversion to such treatment. Not only doctors but also many of the relatives of leucotomized patients had a bad conscience about it. Mr. Schorstein felt strongly that leucotomy ought to be rejected as a permissible treatment just as the medical profession had actually rejected it in 1890 when Burckhardt, in Switzerland, performed cortical extirpation for the first time.

Mr. J. E. PATERSON (neurosurgeon) also expressed his concern about leucotomy. When doing a leucotomy he was asked to damage healthy brain tissue, while in his other work he had to take the greatest pains to preserve as much brain tissue as possible. Secondly, no neurosurgeon could predict with any accuracy the mental effects which this operation would have. That was true not only of the usual operation, where parts of the brain were destroyed without visual control, but also of topectomy, where the parts were seen. Lastly, he was uneasy about the division of responsibility in those cases where the treatment was recommended by a psychiatrist and executed by the neurosurgeon. In all other cases the neurosurgeon made his own diagnosis and took full responsibility for his treatment. The division of responsibility opened the road for abuse.

Dr. J. B. GAYLOR (neurologist) shared the concern which was felt by the other speakers, but described a patient who after leucotomy had successfully completed a professional training demanding high sensitivity and artistic differentiation. This patient was now a much healthier and happier person than ever before, and no personality defects resulting from the operation had been detected in spite of great attention being given to this question. The Discussion Group felt, however, that this case could not fairly be used in argument, because in all probability the operation had produced too little destruction of brain tissue for the usual defects to become evident. Dr. I. CAMERON (psychiatrist) said that leucotomy appeared to him as spiritual euthanasia: it preserved the form and sacrificed the content of the personality.

Leucotomy Justified in Hopeless Cases

The other psychiatrists, psycho-analysts and psychotherapists present did not agree with Mr. Schorstein's total rejection of the operation. Objection could not be taken to the operation on the ground that it destroyed the moral personality in cases where illness had done this more radically already. However, all agreed that the operation should be regarded as a last resort in desperate and otherwise hopeless cases. Concern about any wider application of leucotomy was general, and it was felt that this question should be much more carefully considered.

Reply of an Advocate for Total Rejection

In reply Mr. SCHORSTEIN said that leucotomy had not arisen out of a new knowledge of man and of mental illness but out of a new attitude to and a new valuation of man. Out of that came the Nazi attitude towards the chronically ill and the lunatic and the modern practice of leucotomy. He did not believe that individual suffering, be it mental or physical, or a saving in expenditure on mental hospitals could justify a procedure which did away with the highest

faculties of man. Neither could he believe that the abuse of the operation could be stopped unless one rejected it completely as a permissible treatment. They should learn from the experience of the last 15 years. The urge of both doctors and relatives of the patients that something ought to be done, the consideration that the operation promised to be more effective when performed early, and the inability to define clearly the cases where the operation might be permissible, all created a tendency to apply it too widely and to neglect serious attempts at alternative treatment. It was a question of principle, and no compromise was possible.

Correspondence

Sickle-cell Anaemia in Africa

SIR,—I read with great interest the two papers and your leading article on the sickle-cell trait (February 23, pp. 404, 405, and 426).

Some views expressed in these articles could have been greatly modified if an important work done in the Belgian Congo had been taken into account. But as the results of the latter were published in the French language they have probably escaped the attention of British readers. Sickle-cell anaemia was first reported in our territory in 1950 by Parent,[1] who described two cases in children. A survey of the tribal incidence of the trait was made by van den Berghe and Janssen[2]: frequencies between 1.68 and 25.9% were recorded; the lowest rate was found in groups with a strong Hamitic racial element and the highest in Efe pygmies. The most important contribution, however, is that of Lambotte and Legrand,[3] two eminent paediatricians working at the Leopoldville Red Cross Hospital. Their results contrast strikingly with the opinion of Jelliffe and many other African workers. In the period between 1948 and 1950, the Belgian authors found 100 well-established cases of sickle-cell anaemia, all of them in children under 11 years of age. Since their paper was published 100 new cases have been noted. The genetical treatment of their material leads to the general conclusion that—apart from a very few exceptions—the homozygous state of the sickle-cell condition *means* sickle-cell anaemia. The high fatality rate of their patients in the period between 6 and 18 months of age offers a good explanation for the rarity of the anaemia in adults. Hitherto, only one case of the disease in an adult has been reported at Leopoldville.[4] In American negroes sickle-cell anaemia is not so rare in adults, and anaemia is not always the dominant clinical feature. The poor hygienic and alimentary condition of African natives and the relative lack of hospital facilities may be responsible for this difference.

The frequency of sickle-cell anaemia, as observed at Leopoldville, agrees almost perfectly with that calculated from the sickling frequency. It is not so surprising that Dr. Jelliffe failed to demonstrate the difference in sickling rate that must exist between young and adult age groups. The most interesting group, 2 weeks to 6 months, was not substantially represented, and this renders it *a priori* impossible to detect with statistical significance small differences of the order of 1.5%. We do not know of any statistical study sufficiently accurate to solve this problem.

Independently of the previous workers we have started a study of sickle-cell anaemia at the Government children's clinic, Leopoldville (Dr. Perin). Our results are in full agreement with those of Lambotte and Legrand: since August, 1951, more than 40 cases have been observed, and all the mothers of children suffering from the disease were carriers of the trait.

The position of the Belgian Congo is in no way unique in Africa, as similar observations were announced from Kenya Colony.[5]

It appears to us that a careful search must be made for sickle-cell anaemia in African children before one tries to explain its "undoubted" absence.—I am, etc.,

Institut de Médecine Tropicale, Reine Astrid, Léopoldville, Belgian Congo.

J. M. VANDEPITTE.

REFERENCES

1 *Ann. Soc. belge Méd. trop.*, 1950, **30**, 47.
2 Ibid., 1950, **30**, 1553.
3 Ibid., 1951, **31**, 207.
4 Vandepitte, J., and Pieters, G., ibid., 1952, **32**, in press.
5 Foy, H., Kondi, A., and Brass, W., *E. Afr. med. J.*, 1951, **28**, 1.

Pulmonary Embolism

SIR,—I read with great interest the article on pulmonary embolism by Dr. D. S. Short (April 12, p. 790). Any measures which may diminish the incidence and morbidity of this distressing and occasionally tragic condition deserve wide ventilation.

I have no wish to be hypercritical, but surely "tromexan" has replaced dicoumarol as an anticoagulant? Tromexan exercises its effect within a few hours of administration, which renders more than two or three injections of heparin unnecessary, and, even more important, its action persists for only 12 hours or so after withdrawal.

It is wisely stressed that thrombosis commonly originates in the veins of the calf or even in those of the foot, and in the series under review thrombosis of veins in the soleus muscle was found at necropsy in four cases. From the surgical aspect this is of vital importance, as compression of the veins of the calf on the operating table, with consequent interference with venous drainage from the calf and sole, is so easily preventable. It should be an inviolable rule that during any operation on a patient who might develop thrombosis *the heels must be supported so that the calves are raised from the table*. This is readily accomplished by means of a sandbag, a folded pillow, or, better still, by a special support of "sorbo" rubber which is wrapped in jaconet and bound with adhesive plaster. This support is easily prepared, and the theatre staff learn to use it as a routine; 4 by 4 by 18 in. (10 by 10 by 45 cm.) are suitable dimensions. It might even be said that a surgeon who neglects this simple precaution might be held responsible—at least by his own conscience—should a patient on whom he operates develop a pulmonary embolus or infarct.

If a patient develops a massive embolus an immediate injection of papaverine may relax the associated arterial spasm and so tide him over the crisis. Therefore, in every ward, especially gynaecological or surgical, where cases of embolism may occur, papaverine (1 gr.—65 mg.) in a sterile syringe should be kept in the drug cupboard, for immediate administration by the sister or nurse in charge to any patient who is seized with sudden dyspnoea and severe collapse. The syringe is conveniently kept in a cellophane envelope and plainly labelled. Thus a fatal crisis may be averted until medical advice and resuscitative measures are obtainable, and even if the diagnosis is incorrect—e.g., coronary thrombosis—no harm is done by this timely intervention.—I am, etc.,

London, W.1. MCNEILL LOVE.

Ryle's Tube in Trachea

SIR,—May I add my mite to the discussion (see March 29, p. 710) on the Ryle's tube?

If the patient is unconscious it is a difficult matter to pass the Ryle's tube satisfactorily into the stomach. There are three ways of doing this. One is by direct vision through a laryngoscope, passing the tube behind the larynx and actually seeing its passage into the oesophagus. This method does not prevent kinking and curling up of the tube upon itself. The second method is by introducing McGill's endotracheal tube into the oesophagus and passing the Ryle's tube down through this. I had made for me a plastic tube to avoid the difficulties of kinking, and have found this very satisfactory. We have also noticed how the Ryle's tube tends to enter the larynx and trachea if an endotracheal tube is in position. Hence the stress laid upon the passage of the Ryle's tube by direct vision.

Some years ago I went into a ward to see a certain house-surgeon who had at that moment just passed an ordinary large oesophageal tube with a view to washing out the stomach. He stood with the jug of water in one hand poised over the funnel of the oesophageal tube. Fortunately we both heard air whistling in and out of the oesophageal tube, which was, in fact, in the trachea. I never thought that it would have been possible to pass a tube straight into the trachea, as was done in this case, without any cocainization in the larynx.—I am, etc.,

London, W.1. FRANKIS EVANS.

Qualifications of Coroners

SIR,—By the Coroners (Amendment) Act of 1926 no person may be qualified to be appointed to be a coroner unless he is a barrister, solicitor, or legally qualified medical practitioner, of not less than five years' standing in his profession.

This society, all the members of which are members of both the legal and the medical professions, is seriously disturbed at the fact that some local authorities, in whom the power of appointment is vested, are seeking to avoid or to limit the candidature of medical men for the appointment of coroner. In Essex, where a vacancy has recently occurred on the death of a distinguished and doubly qualified coroner, the county council has taken the retrograde step of inviting applications from barristers and solicitors only. In London, by a resolution of the council in 1937, future appointment of coroners was limited to those possessing legal qualifications of five years' standing, or those possessing legal qualifications of less than five years together with medical qualifications of five years or more. This resolution has recently been reinforced by a letter from the council to the London coroners stating that the same provisions will now be applied to the appointment of deputy coroners. My society feels that this decision will merely increase the very great difficulty which already exists in finding persons with appropriate qualifications who are willing and able to act as deputy coroners.

The greater part of a coroner's work is not done in open court, but in his office; in the populous districts in the jurisdiction of members of this society more than three-quarters of the reported deaths are dealt with as non-inquest cases, after a post-mortem examination. In the reading and assessment of a pathological or a post-mortem report it seems unlikely that any marked advantage will be found in legal qualifications and experience, rather than in those of the trained medical mind, and it is of interest that the ratio of inquest cases to non-inquest cases tends to be higher where the coroner has no medical knowledge or qualification.

I believe that a committee of the Association which considered, among other things, this very question was of the opinion that it was desirable that coroners should have both qualifications, but that they should certainly be medically qualified. The matter is clearly of importance to your readers and to the public.—I am, etc.,

C. F. J. BARON,
London and Home Counties Coroners' Society. Honorary Secretary.

Admissions to Mental Hospitals

SIR,—It is unfortunate that, in his second article on "The Psychiatric Case and the Law" (April 12, p. 810), Professor Alexander Kennedy should have permitted a mis-statement to have slipped in. He says that "over half the patients in mental hospitals in this country are voluntary patients under the Mental Treatment Act of 1930." This is not so.

Considering the nature of mental illness and the traditional fears in connexion with it we must feel that it is satisfactory that in any one year something over 60% of the total direct admissions of the mental hospitals in England and Wales are voluntary patients. The majority of these are short-stay patients, and there is a rapid turnover, but of the total patients (over 140,000) under care and treatment not more than about 20 per cent are of voluntary status—of the remainder all are detained "under certificate" with the exception of a very few Section 5 temporary patients. It is to be hoped, most sincerely, that in the near future it may be possible for Parliament to find time to modernize and simplify the law as regards admission to mental hospitals. The most welcome and progressive legislative step would be for all first admission patients who are not suitable for voluntary treatment to be admitted purely on medical recommendation as temporary patients and so remove the out-of-date judicial intervention—i.e., the reception order.—I am, etc.,

Eastbourne. W. GORDON MASEFIELD.

Attempted Suicide

SIR,—The Chairman of the Central Ethical Committee laid down (March 22, p. 657) very definitely that a doctor was not obliged to answer for an attempted suicide. Clearly this is incompatible with the law as most of us have understood it in the days before the war. Are we to understand that the Board of Control would sanction the admission of an attempted suicide to an open nursing-home without any legal formalities and without the condition of a fully qualified doctor living on the premises?

I ask this question because I have clear memories of more than one open nursing-home which was shut down by order of the authorities on account of an attempted suicide.—I am, etc.,

Harrow-on-the-Hill. H. CRICHTON-MILLER.

SIR,—With reference to Dr. J. G. Thwaites's letter (March 22, p. 657), a section in the Gold Coast Coroners Ordinance, revised, which came into force about the middle of 1946, provides that if a person is admitted to a hospital on account of a disease or injury which the "person in charge" of the hospital suspects to have been unnaturally caused, which may result in the death of the patient, the person in charge of the hospital shall forthwith inform the sergeant in charge of the nearest police station. Penalty for failure to do so, on summary conviction, six months' imprisonment or £100 fine, or both.

Being myself at the time the person in charge of the largest hospital in the Gold Coast (there was no branch of the B.M.A. in the country), I wrote to the B.M.A. suggesting that steps should be taken to get this disgraceful section repealed.—I am, etc.,

Bristol. G. L. ALEXANDER.

Stage Hypnotism

SIR,—Your correspondent, Dr. J. F. Tuthill (April 12, p. 816), is in error in claiming that no doctor has reported on a single case of harm resulting from stage hypnotism. Five such cases are reported in Vol. 3, No. 3, of the *British Journal of Medical Hypnotism*. Another, resulting from amateur "mesmerism," was reported in Vol. 2, No. 3. The Maudsley Hospital will no doubt be pleased to satisfy his curiosity concerning at least one case admitted for several weeks, and ill for years. Reference to the Ministry of Health, the National Association for Mental Health, Dr. Somerville Hastings, the sponsor of the Bill to ban stage hypnotism, as well as the several hospitals to which cases have been admitted recently should convince him that his "sporting contest" is not without considerable danger. These are known and proved cases. It is quite possible that there are many other cases of mysterious neuroses either unrecognized or too afraid to come forward for fear of unwelcome publicity.—I am, etc.,

London, W.1. S. VAN PELT.

SIR,—I do not understand how Dr. J. F. Tuthill (April 12, p. 816) enjoyed the *sporting* element in the contests between the hypnotist and subject. Is he referring to the trick of

pressing over the carotid arteries and carotid body to induce the trance, or of the giving of suggestions such as, "Cry for your Mummy," or jumping up from a supposedly hot chair, or shouting, "Peanuts," or drinking cold tea in pretence for champagne, or passionately kissing a stranger, or any of the other sporting events the subtle stage hypnotist invents? I suggest it would be more amusing for the doctor to see a real sporting event like a bullfight or stag-hunt. Dr. Tuthill does not seem to appreciate that the majority of the audience leaves the theatre either disgusted at the performance or merely dismissing the subject as a fraud with paid stooges. I very much doubt whether one person seeing stage hypnosis has left realizing "the relationship between mind and body."

Hypnosis, in the form of hypnotherapy, is a recognized branch of medicine. If Dr. Tuthill possessed psychiatrical training he would have used this valuable ally in many of his more difficult patients, and he would also appreciate how this therapy suffers disrepute and discredit at the hands of stage hypnotists, charlatans, and quacks, which grossly interferes with its proper use by members of the medical profession.—I am, etc.,

London, N.15. GORDON AMBROSE.

Hypnotism in Medicine

SIR,—In Dr. A. E. Bernstien's letter (April 12, p. 816), although he agrees that hypnosis can cure cases of psychogenic asthma, he states that the bronchitic asthma and the pure allergic type cannot derive lasting benefit. In cases of bronchial asthma where skin tests have been found to be positive Hurst pointed out that desensitization by means of injections had no greater effect than the injections of physiological saline solution, while Herxheimer's experiments (*Int. Arch. Allergy*, 1951, 2, 40) with house dust showed that among the patients giving a positive skin reaction a high proportion did not give any bronchial reaction. Conversely, in some patients skin reaction was negative, but they had bronchial spasm.

Watkins (*Practitioner*, 1952, **168**, 33) has stated that, "Performance of skin testing is impressive to patients, but I have long ceased to use skin testing because I have found that they tend to mislead rather than guide." Clarke (*Practitioner*, 1949, **163**, 130) stated that in a series of 30 cases of bronchial asthma in children only three gave a history suggesting hypersensitivity to the common allergens.

Allergic disposition may be present in a patient, but under normal emotional conditions the allergy may be latent or mild and yield to conventional treatment. Under the stress of emotions, however, it can become chronic and disabling. When this occurs it can again be eliminated by therapy of the emotional factors even though the skin sensitivity tests remain positive.

One physician quotes the case of a patient who is sensitive to ragweed pollen, but who interestingly enough does not have these attacks when his mother-in-law is out of town. One of my patients, a girl of 20, was allergic to chocolates and knitting wool, while a boy of 15 was sensitive to onions and plums. With reassurance under hypnosis they now eat their so-called allergic foods with complete indifference and with the absence of any asthma.

I reported a case (*Med. Press*, 1951, **225**, 239) in which a boy aged 13 had injections for allergic asthma each year for eight years without any result, and the attacks stopped immediately by suggestion under hypnosis. Five years later there was still no recurrence. I question every asthma patient who is referred to me for hypnotherapy about tests they have had for allergy, and they fall into two groups. The first group have been tested for everything and give negative results, while the other group have been tested, found sensitive, and had injections for desensitization without any positive result.

I would humbly suggest that physicians in asthma clinics pay more attention to emotional factors like excitement and worry, acute or chronic anxiety states, shyness, frustration and inferiority complex, or a tendency to make mountains out of molehills, rather than devoting all their time to skin tests. The results are far more satisfactory.—I am, etc.,

London, W.1. A. P. MAGONET.

SIR,—Some of your correspondents are writing enthusiastic letters on the use of hypnotism in the treatment of chronic asthma. Historically, the asthmatic path is so littered with the corpses of "new cures" that a certain scepticism would appear to be excusable.

The late Sir Arthur Hurst made some cogent statements on the subject of "Asthmatic Treatments" in an address to members of the Section for the Study of Diseases in Children of the Royal Society of Medicine on November 27, 1942. After some sobering remarks on the unhappy fate of certain treatments, he concluded his peroration as follows: "All these forms of treatment produce approximately the same percentage of temporary 'cures.' They are so diverse in nature that the only thing that they have in common is the faith their exponents have in them, a faith which is transferred by suggestion to the patient with sufficient strength to be successful in about 75% of cases. Unfortunately, the asthma diathesis remains unaffected, so that recurrence is just as frequent as after spontaneous remissions."

In all diseases with a tendency to spontaneous remission, exaggerated claims are liable to be made for this or that treatment. The claims for hypnosis as a potent therapeutic agent in the treatment of chronic asthma appear to originate from the belief that asthma is largely psychogenic. Attempts to explain the asthma syndrome in terms of escapism, morbid gain, and unresolved conflict are frequently quite unconvincing.

At present, spaced injections of A.C.T.H. would appear to hold out more hope for the chronic asthmatic than does hypnotism.—I am, etc.,

Littlemore, near Oxford. J. TODD.

Growth of the Foetal Head

SIR,—I have read with interest Dr. I. Macdonald's important paper (April 12, p. 798) in which he deduces that the foetal head continues to grow after the 36th week of pregnancy. He rightly stresses that his findings disprove Joseph's (1949) view that the biparietal diameter fails to grow in the last month of pregnancy.

The "rate of growth" of the foetal head seems almost as important to me, because the cephalo-pelvic relationship is often deduced from the findings of cephalo-pelvimetry examination performed at the 36th to 37th weeks of pregnancy. Whereas the average of Macdonald's post-natal measurements suggest that the growth rate of the biparietal diameter is 1 mm. per week, Scammon and Calkins (1929) declared that the growth rate was 2.5 mm. per week, and Moir (1949) stated that the growth rate was 2 mm. per week.

In this connexion my own findings (in press) are relevant. They result from an investigation which I have conducted for the past three years in the Nuffield Department of Obstetrics and Gynaecology, with the aid of additional clinical material obtained from the Area Department of Obstetrics and Gynaecology, Oxford. They are based upon a series of 40 patients. In these the intrauterine growth was estimated by a comparison of intrauterine cephalometry measurements with those obtained two to five weeks later by radiological post-natal cephalometry performed 48-72 hours after birth. In this series the average growth rates (per week) of the biparietal diameter, occipito-frontal diameter, and average cranial circumference were 1 mm., 1.2 mm., and 3 mm. respectively.

The view is widely held that the growth rate of the foetal head diminishes rapidly after term. Yet my findings were unaltered in those cases (nine) in which intrauterine growth, during the period one to three weeks after term, was estimated. Consequently I believe that the growth rate of the foetal head is little altered in the "overdue" period of gestation (41 to 43 weeks).—I am, etc.,

Oxford. DERK CRICHTON.

REFERENCES

Moir, J. C., and Kerr, J. Munro (1949). *Operative Obstetrics*. 5th ed. London.

Scammon, R. E., and Calkins, L. A. (1929). *The Development and Growth of the External Dimensions of the Human Body in the Fetal Period*. Univ. of Minnesota Press.

Habitual Abortion

SIR,—May I deal on behalf of myself and my colleague, Mr. Richards, who is at present abroad, with the comments of Mr. T. B. FitzGerald and Mr. D. C. A. Bevis (April 12, p. 819) on our letter (March 15, p. 604)?

Both Mr. FitzGerald and Mr. Bevis have quoted the following sentence from our letter out of context: "Whether the patient stands this better chance because of the endocrinological, psychological, or any other effect of the implant is, to our mind, beside the point." The theme and argument of our letter were that because we personally believe that progesterone is of therapeutic value in habitual abortion (though we have been careful not to claim to have proved that it is) we would feel morally obliged to continue, at the present time, treating patients with a history of habitual abortion with progesterone. It is "*beside the point*" *as far as our moral obligation is concerned* whether the therapeutic effect is produced by endocrinological, psychological, or any other means.

In order to explain our attitude to those who have not followed this correspondence from the beginning a little recapitulation is necessary. In 1950 we published in the *Journal* (July 15, p. 130) a paper recording a study of 45 cases of habitual abortion in which progesterone had been implanted in the pregnancy under consideration. In 1952 we published a further series of 40 cases (February 2, p. 244). Of the patients in this combined series who had had three or more previous abortions 72% produced living children at the end of the pregnancy in which they received a progesterone implant. Dr. Richard Doll, of the Statistical Research Unit of the M.R.C., studied these results and expressed the opinion that they are of significance provided that the incidence of true habitual abortion is not much less than 0.1%. We have therefore formed the personal opinion that progesterone implants are of therapeutic value in this condition.

But to suggest that we claim to have proved it, as Mr. Bevis does in his letter, is less than fair. Indeed, we were at great pains to avoid making any such claim. Instead, in our second paper, we wrote as follows: "One is, of course, always conscious of the possibility that the particular pregnancy under consideration may have gone to term without therapeutic aid. It is for this reason that we sought statistical advice. . . . One cannot, however, altogether exclude the psychological factor. . . . Possibly the psychotherapeutic effect of an implant . . . may in some cases supply the necessary confidence to enable the patient to retain the embryo during those early critical days." We then referred to Mr. Bevis's paper (*Lancet*, 1951, 2, 207) in which he reported a study of 32 patients with a history of three or more previous abortions. These patients were submitted to an elaborate series of investigations, but, in our opinion, no effective treatment. Twenty-six (81%) gave birth to live children. We postulated that the elaborate investigations may have constituted an effective form of psychotherapy, though we find it difficult to understand how in 65% of the women who have had three miscarriages the abortions have resulted purely from psychological causes. (The figure of 65% is obtained by subtracting from Mr. Bevis's 81% the 16% that Malpas and Eastman calculated as being the expected spontaneous cure rate in patients who have had three previous abortions.) We suggested, however, that "there is an obvious way of settling the question whether a progesterone implant is endocrinologically or merely psychologically therapeutic—namely, to treat alternate cases with implants of progesterone and an inert compound." Mr. Bevis in a letter subsequent to our paper (February 23, p. 440) said, "I await with great interest the results of a series of patients treated by Drs. Bishop and Richards with the implantation of inert tablets." It was in reply to this that we wrote to point out that as we still held the personal opinion that progesterone was therapeutically effective, though how it was seemed "beside the point" (namely, irrelevant to the present argument), we felt ourselves morally obliged to continue to treat patients with habitual abortion with progesterone. Mr. Bevis's suggestion that in adopting this attitude we, as "acknowledged leaders of thought on the subject," are insisting that there is a moral obligation to continue one form only of treatment is an unfortunate misinterpretation of the situation. I have reread our letter and I am satisfied that it conveys the meaning which we had intended—namely, that the moral obligation applied only to us, and that we personally would not be justified in implanting some patients with inert pellets. If my wife had had three miscarriages and was pregnant I should most certainly ask one of my colleagues to give her a progesterone implant. How could I, therefore, implant an inert substance in similar circumstances into any patient entrusted to my care? There are others, however, who do not believe that progesterone therapy plays any part in the treatment of habitual abortion. They could with a clear conscience conduct the crucial experiment we have suggested —namely, to implant alternate cases with progesterone and an inert substance respectively.

It is possible that in our previous letter Mr. Richards and I did not convey our attitude to this problem as clearly as we might have done. It is therefore possible that some readers may have misunderstood us, as Mr. Bevis apparently has, to propound that if you believe that a certain form of treatment is effective you are morally obliged to exclude the trial of any other form of treatment. But I cannot excuse the tone of Mr. FitzGerald's letter. He suggests that our attitude is "neither scientific nor honest"—and to this I take great exception. But his subsequent remarks seem intended to cause gratuitous offence not only to me, but to all my colleagues who have devoted themselves to the establishment of clinical endocrinology as a respected and progressive branch of medicine. He says, "If the leaders of thought in this field are to encourage this unscientific trend" (namely, "the strong temptation to the use of the hormones empirically or even with some flavour of quackery"), "then the next meeting of endocrinologists should include a deputation of witch-doctors from darkest Africa to assist progress in this art." I find these words crudely offensive. Your correspondence columns provide an excellent opportunity for all who wish to indulge in frank expression of opinion, healthy criticism, and democratic disregard for the status of the person criticized. It would be a pity if they were to contain many letters written in the tone adopted by Mr. FitzGerald. —I am, etc.,

London, W.1. P. M. F. BISHOP.

*** This correspondence is now closed.—ED., *B.M.J.*

Early Treatment of Poliomyelitis

SIR,—May one be allowed space for a few comments on Mr. G. P. Mitchell's interesting article on the early treatment of poliomyelitis (March 22, p. 649)?

First, his stress on the need for team-work is admirable, but he says all too little about the part that the nurse plays in the team, the fundamental part, which means that the best orthopaedic surgeon in the world could not get first-class results with patients in an understaffed fever hospital, an aspect which Dr. Ritchie-Russell stressed in a recent postgraduate lecture in Edinburgh. In the Bath orthopaedic scheme the team, as described by Mr. Mitchell, functioned many years before the severe epidemics of 1947 onwards, but until the numbers became unmanageable every acute case, as soon as diagnosed and as soon as transportation was safe, was admitted to the central orthopaedic hospital, where it came under the care of very skilled and experienced sisters. The results of this system were able to be compared (as far as any two cases of poliomyelitis are ever comparable) with the system under which the cases were visited by the orthopaedic surgeons in fever hospitals under skilled and co-operative matrons, but where the junior staff had no experience of splinting, etc. The lag in recession of paralysis and the frequency of steadily increasing spread for a week or two in cases which at first appeared very mild were very noticeable in the fever hospitals.

Secondly, one is glad to find Mr. Mitchell warning against too zealous disturbance of the patient in the first few days or even weeks, whether for the application of hot packs or early massage, etc. In Bath we found that thick layers of cotton-wool provided

all the soothing heat required for the limbs, or occasionally with "antiphlogistin" to a joint with synovial effusion. As regards backache and other trunk pains: we found that cases placed at the earliest possible moment on a Jones's frame with its lamb's-wool saddle got rapid relief, often on the first night. They were not forcibly strapped down, but the frame was used as a tray to lift the patient in one piece during nursing procedures.

Thirdly, as regards efforts to restore function in affected parts: the sling method which Mr. Mitchell recommends is admirable in this respect, for reflexes from the joints and from muscle tension call out just those frequent, small contractions of weak muscles which are needed to develop them in a way no massage staff has time for. It was found that the Guthrie-Smith sling with one loop above and one below the elbow was more convenient than the wide sling illustrated, and it needed counter-slinging accurately so that the limb was floating quite free, as if in water. The fitting of the weights is a bother to the nursing staff and requires judgment, but gives dividends well worth while.

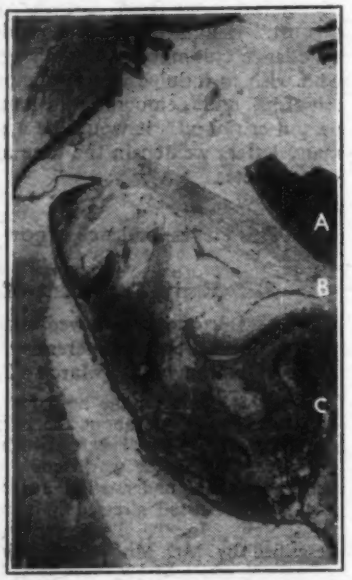
The re-education of all the trunk muscles occurs naturally in the prone position in all but the most paralysed cases, and again the turning and twisting induced by curiosity provide admirable small contractions. When prone, the patient must have a bed-table with a pillow to rest paralysed arms, which rarely need suspension in this position. It is astonishing with what weak limbs the patient can feed himself in this position, especially if the thumb is supported by the roll in the palm. It is more convenient to make this of "perspex," as a bandage soon becomes soiled or wet with sweat.—I am, etc.,

Edinburgh. MAUD F. FORRESTER-BROWN.

Retrolental Fibroplasia

SIR,—I read with great interest the article by Dr. B. A. Bembridge and his colleagues (March 29, p. 675). This is an excellent survey of retrolental fibroplasia, but one point which is certainly the most striking one in the pathological picture is not marked.

The anterior end of the detached retina which usually accompanies the disease does not end at the ora serrata as it usually does, but continues for a variable distance on to the ciliary body. Also this anterior end consists, not of retina, but of a single layer of ciliary epithelium. This can only mean that the two layers of the ciliary epithelium have never become united; and as this normally happens at the third or fourth month of intrauterine life the unknown "noxious stimulus" must have affected the embryo before this date.



Section of eye showing anterior end of detached retina (C), the membrane (B), and the lens (A). (×39.)

I have suggested elsewhere (*Proc. roy. Soc. Med.*, 1950, 43, 227, and *Amer. J. Ophthal.*, 1950, 33, 1768) that the probable course of events in a typical case is as follows. A noxious stimulus reaches the embryo very early, probably in the first few months of intrauterine life. Its effect on the eye is primarily on the retina, which remains non-attached in part or as a whole. (The noxious stimulus may affect other parts of the organism, especially the brain, as pointed out by Krause, hence his name for the disease—encephalo-ophthalmic dysplasia.) Fluid collects under the retina, and a real detachment is produced which gradually becomes total. This may give rise to a mild uveitis, which is responsible for the retrolental membrane and the posterior synechiae when these are present.

I am enclosing a picture of a section of the anterior end of the detached retina.—I am, etc.,

London, W.1. EUGENE WOLFF.

Penicillin Dangerous?

SIR,—My dental colleague's excursion into the realms of medical literature (April 12, p. 817) errs on the side of flippancy and has no relation to established practice by many dental surgeons of repute. In actual fact the implantation of the penicillin cone into the socket immediately after extraction is clearly the best method of securing an optimum local concentration of the drug, and was the logical sequel to the earlier practice of implanting sulphanilamide powder, which in its day constituted a noteworthy advance in post-operative care of the extraction wound. To those of us who have been in practice over a quarter of a century—a not necessarily enviable distinction—the almost magical improvement in post-operative progress of dental extractions that has resulted from the routine adoption of this technique has proved sufficient justification for its use. In the last six years I have had three cases of pre-existing sensitization which have been activated by even this small local dose of the drug, but, as nowadays every patient who is afflicted in this manner is the first to warn the operator, the risk is minimized as far as is practicable, and must be taken in view of the inestimable benefit that invariably accrues.—I am, etc.,

London, S.W.1. ROBERT CUTLER.

Debauchery of Honest Words

SIR,—Professor A. D. Gardner (March 29, p. 715) complains of "undoubted debauchery" in the use of the word epidemiology, yet he picks his words with fine abandon. The *O.E.D.* also reminds us that John Milton spoke of "epidemick whordom." Whether or not Milton meant "widely prevalent" in the sense now described by the shorter *O.E.D.* as obsolete may possibly be questioned, but the narrower definition quoted by the professor from the Sydenham Society Lexicon (1879–99) was certainly not available to Milton. The meanings of words change in course of time. Does the professor use "debauchery" with its current meaning of "vicious indulgence in sensual pleasures," or does he this time prefer the obsolete meaning "seduction from duty or virtue"? Would he regard the "spectrum of antisocial activity" as a pardonable figure of speech? Even in the sense of epidemiology which he employs I know of no writer on social medicine who has referred to the epidemiology of hare-lip, but the incidence of coronary thrombosis "upon the people" certainly appears to be increasing at the present "special time."—I am, etc.,

Abingdon. R. W. PARNELL.

Is Latin Dead?

SIR,—Your annotation on the *National Formulary* (March 29, p. 701) suggests that Latin is no longer the common language of scholars and doctors, and should, by inference, be abandoned as an unnecessary tax on the doctor's brain. May I beg leave to doubt your premises and disagree with your conclusions?

I have had case notes in Latin sent to me by a Polish doctor who spoke no English. I have seen an Irish priest, who spoke no Italian, conversing with an Italian priest in classical Latin. The names of the various parts of the body are Latin and are largely international.

Moreover, there is surely some inconsistency in forcing the metric system down our throats in every article in the *British Medical Journal*, just because it helps a handful of foreign readers, and abandoning the small scrap of ground on which we can speak the same tongue as all other nations.

Finally, is it always expedient to write a prescription in a language understood by the patient?

I fully agree that our knowledge of Latin is small—witness the word "foraminae" in the leading article on osteoarthritis (January 26, p. 208), the use of "erector spinae" as a plural form in the article by Mr. J. G. Bonnin (March 8, p. 540), and frequent advertisements by a drug firm headed "Pro Infans"—but our knowledge, though small, is not useless.—I am, etc.,

Devonport. J. LAWRENCE HENRY.

Obituary

H. H. GLEAVE, M.B., M.R.C.P.

Dr. H. H. Gleave, director of pathology to the Southampton group of hospitals, died suddenly on March 31, at the age of 57. Humphrey Hart Gleave was born on November 2, 1894, the younger son of the Rev. Thomas Gleave, and was educated at Bradford and Lancaster Grammar Schools and at the University of Leeds, where he had a distinguished career, graduating M.B., Ch.B. with first-class honours in 1920, and winning the William Hey gold medal as the most distinguished graduate of his year. After graduation he became a demonstrator in the pathological department of the University of Leeds and was subsequently lecturer in pathology in the Universities of Sheffield and Liverpool. He became a Member of the Royal College of Physicians in 1925. Some years later, in 1933, he moved to Southampton on his appointment as pathologist to the Royal South Hants and Southampton Hospital. Here he was responsible for the planning of the Bernhard Baron Memorial Laboratory, opened in 1937, which became the chief laboratory in the group of which he was appointed director in 1948. Possessing a wide knowledge of his subject, with sound judgment and a keen desire to help his colleagues and patients, he soon won the respect and esteem of all those associated with him. Most evident were his sincerity and his kindliness, so that his opinion was constantly sought by his colleagues on the many problems encountered in hospital and medico-legal work. He gave gladly of his time and services and in a discussion would usually provide the key to a difficult problem. Although greatly handicapped by severe asthma, he bore the full responsibility of conducting the Southampton pathological services during the trying years of the last war. His courage and patience were never more apparent than in his later life, when he was seldom free from distressing symptoms. In his younger days he had been a keen rugby player, and he maintained an interest in sport in his later years. Always an omnivorous reader, with a wide curiosity ranging beyond medicine, he brought a critical and well-informed mind to all subjects, and this, seasoned with an impish humour, made him a delightful companion. He made many contributions to pathological literature before assuming the onerous responsibilities of a large department. He is survived by a widow and one son.—E. S. D.

S. N. L. writes: By the sudden death of one of our most respected colleagues we in Southampton have suffered a grievous loss. When Dr. H. H. Gleave was appointed pathologist to this area 19 years ago we realized that a man with a brilliant academic career before him had chosen to work among us. His profound knowledge of clinical pathology was a source of great practical help to his colleagues on the staff of the hospitals and to the practitioners in the area. His wide experience and deep understanding helped to solve the many problems we brought to him. It was invariably an inspiration to have the privilege of consulting him, and his help was widely sought and highly appreciated. He brought the pathological services of the area to an advanced stage of development, and frequent ill-health did not interrupt him in this great task. His organization of a very efficient blood transfusion department was an example of his great ability. In addition to his reputation as a pathologist he was an expert in medico-legal matters. Dr. Gleave was a widely read man of profound knowledge and deep culture. His courtesy in his dealings with his colleagues was one of his characteristics, and we remember his modesty and willingness to help on all occasions. In his busy and useful life, sadly cut short, he was sustained by an able and devoted wife, and to Mrs. Gleave and their only son we extend our deep sympathy.

Lieutenant-Colonel ALEXANDER GLOVER COULLIE, I.M.S. (ret.), who died at his home at Alton, North Staffordshire, on March 17, after a very short illness, was educated at the University of Edinburgh, where he graduated M.B., Ch.B. in 1904, proceeding M.D. in 1921. After graduation he held the post of house-surgeon at Edinburgh Royal Infirmary, and this was followed by house appointments at the Royal Sea-bathing Hospital, Margate, and the Hospital for Sick Children, Great Ormond Street, London. He took the F.R.C.S.Ed. in 1907, in which year he sat the entrance examination for the Indian Medical Service, passing with the highest marks. In India he held many important and responsible positions, and was a member of the staff of the hospital where Gandhi had his appendix removed. This must have been an anxious time for the medical staff, since several thousands of Indians crowded round the hospital awaiting the result of the operation. During the war of 1914–18 Coullie served in Palestine and the Middle East, and in 1920 was awarded the Order of the Nile by the Sultan of Egypt. He retired from the I.M.S. in 1925 and set up in general practice at Cheadle, Staffordshire, where he upheld all the great traditions of the I.M.S. as an efficient and knowledgeable doctor. A son of the manse, he was a devout churchman and took great interest in Bible classes for young men. He also did good work for medical charities, and for some years past he had been the local secretary of the Royal Medical Benevolent Fund. A man of great integrity, he endeared himself to his patients and his friends in all walks of life. He leaves a widow and two married daughters, to whom much sympathy is extended. —G. S.

Dr. W. A. MURRAY, who had had a varied and distinguished career in many parts of the world, died suddenly on March 24 in London in his 89th year. William Alfred Murray was born at Hong Kong in 1863, the eldest son of the late Dr. John Ivor Murray, and was educated at Tonbridge School, from which he proceeded to Queens' College, Cambridge, with a mathematical scholarship in 1881. He obtained the B.A. in 1884, and in the same year he won the Jeaffreson scholarship at St. Bartholomew's Hospital, where he began the study of medicine. He continued his studies at the University of Aberdeen, where his uncle, the late Sir John Struthers, was professor of anatomy. After graduating M.B., C.M. at Aberdeen in 1890 Dr. Murray was engaged in private practice for some years and then became chief medical officer to the construction staff of the Sierra Leone railway. Afterwards he was medical officer to the Assam–Bengal railway, and it was while holding this post that he took the D.T.M.&H. of the Royal Colleges in 1912. Returning to England in 1916, he immediately entered the R.A.M.C. and served first in hospital ships, and then, at the invitation of the late Sir Ronald Ross, became staff assistant to Sir Ronald, a position he held until the end of the war. When hostilities ceased he was appointed to the Ministry of Pensions as a tropical diseases specialist in charge of the northern area, with headquarters at Leeds. For his war services Dr. Murray was appointed O.B.E. Later he became medical officer to the British Hospital and to the British residents in Oporto, Portugal. At the outbreak of the last war Dr. Murray offered his services to release other medical practitioners for active service and worked in Exeter for four years. More recently he acted as locumtenent for old friends. With the exception of slight

deafness he was in full possession of all his faculties to the end. Dr. Murray married Miss Edith Sturton, daughter of the Rev. J. Sturton, rector of Woodborough, Wilts, in 1893. The sympathy of a wide circle of friends is extended to his devoted wife, who was his constant companion in his travels, and to his other relatives. There were no children of the marriage.—J. S.

Dr. HARRY CAINE BOYDE died at his home on March 29 at the early age of 48. He was born at Darlington on September 3, 1903, and was educated at Darlington Grammar School and at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1925 and taking the degrees of M.B., B.S. of the University of London in the following year. Dr. Boyde was first in practice in North London from 1927 to 1934 and then at Custom House in the dock area. He was a past-chairman of the old West Ham panel committee. He was also a member of the old West Ham insurance committee from 1943 until the committee was superseded by the West Ham executive council in 1948, when he was elected to the new body. For many years he was secretary of the local medical committee, which he represented on the executive council.

J. A. M. writes: The colleagues of Harry Boyde learned of his death with deep regret and with a sense of profound shock. It was characteristic of him, when he appreciated the seriousness of his condition, quietly to lay down his various burdens and slip away unnoticed. Those who knew him best, however, cannot allow so tragic and so untimely a loss to be recorded without some tribute, even if, as we believe, such would be contrary to his sentiment and to his wishes. Harry Boyde was more than a successful and efficient practitioner. His unusual qualities of administration and organization were in great demand and were placed willingly at the service of the Stratford Division of the British Medical Association, of which he was honorary secretary from 1936 to 1946. During the vital years of the war he was secretary of the Stratford medical war committee, a post in which he displayed, as in everything, a notably impersonal and objective approach to every problem. The same qualities rendered him a valuable member of the Medical Planning Commission, of the B.M.A.'s Protection of Practices Committee from 1943 to 1948, and as the representative of the Stratford Division at the Annual Representative Meetings from 1943 to 1946. The ability to make a painstaking analysis of any problem and so to arrive at an honest opinion about its solution was an attribute which Harry Boyde carried into all his activities. He had an ordered and disciplined mind and an unusual capacity for segregating matters of principle on the one hand from those of personal opinion on the other. An invariably open and frank statement of his own position added to the confidence and respect in which he was held. Whether in or out of office he was always a loyal supporter of the B.M.A., and our Division has lost one of its finest secretaries and a devoted and loyal colleague.

Surgeon Rear-Admiral FRANCIS JOLLIE GOWANS, R.N. (retired), of Highweek, Newton Abbot, died in hospital at Plymouth on April 16, aged 71. He was the eldest of the second family of the late Dr. William Gowans, of South Shields. One of his elder half-brothers was J. J. Gowans, a Cambridge and Scottish international three-quarter back of the early 'nineties. Another brother is a well-known ophthalmic surgeon. "Jimmie" Gowans, as he was known to innumerable friends, was in his early days a very good full back, quite capable of playing three-quarter, like his elder brother, if it were necessary. He was born in 1880, and studied medicine at Durham University, where he graduated in 1903. In the same year he entered the medical service of the Royal Navy. When the first world war broke out he was staff surgeon in the *Queen Mary*, later sunk at Jutland. He then served in the battleship *Albion*, and after the war he was for three years in charge of the naval sick quarters at Yokohama. This was not his first experience of Eastern waters, for as a junior he had been for a year or two in a gunboat on the Yangtze River. He was surgeon commander in the *Repulse* during the tour of the Duke of Windsor (then Prince of Wales) to West Africa and South America. In 1928 he was appointed surgical specialist at Haslar Hospital, and seven years later he was promoted rear-admiral in charge of the Naval Hospital at Plymouth. He retired in 1939, in which year he had been created C.B., but was called back to the active list when war broke out, and commanded the Auxiliary Naval Hospital at Newton Abbot. He had been made honorary surgeon to the King in 1937, and he had the Russian Order of St. Anne (with swords) conferred upon him in 1916. Gowans was exceedingly tall and slim and had a most imposing presence in naval uniform. In character he was of a most disarming modesty and kindliness and very popular with colleagues and patients alike. After finally leaving the Navy he acted for some time as a locumtenent at the Brentwood Mental Hospital. In 1911 he married Sara, daughter of the late Robert Lewis. His wife survives him; there were no children of the marriage.

Medico-Legal

LEITH HOSPITAL FUNDS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On July 5, 1948, the Leith Hospital vested in the Secretary of State for Scotland under the provisions of the National Health Service (Scotland) Act. Accordingly, the board of management for the Edinburgh Northern Hospitals became the body in whom the funds of the hospital should vest.

The liquidators of Leith Hospital (Incorporated) who were responsible for the funds, amounting to some £233,135, were anxious to get a decision of the court before parting with them, since they were doubtful to what extent under the wording of the Act the money did in law vest in the board. The board therefore brought friendly proceedings in the Court of Session so that the question might be determined.

The board contended that what the Act referred to when speaking of funds "held solely for the hospital" was the way in which they were held and applied in fact at the date of the take-over. The liquidators argued that the Act referred to the terms of the objects clause under which the governors of the hospital had held the funds, and that since that clause covered purposes which were not hospital purposes it could not be said that the funds were held solely for the purposes of the hospital.

In his judgment[1] Lord Sorn reviewed the evidence which had been given about how various special funds had been used, and concluded that in fact they had all been or were being used solely for hospital purposes, including the building fund in spite of the fact that the most recent application for a licence for further building had been refused.

He also held that the ordinary fund was administered solely for hospital purposes, as was shown by a survey of how it had been spent over the last 10 years and by the fact that the governing body had put themselves into liquidation after the vesting date.

He agreed with the contention put forward on behalf of the board of management, and made a declaration that both special and ordinary funds vested in the board under the Act and should be transferred to the board. The details of the transfer were left to be worked out amicably between the board and the liquidators.

[1] *The Scotsman*, May 31, 1951.

Medical Notes in Parliament

ISLE OF MAN PARLIAMENT

RISING COSTS OF HEALTH SERVICE

Presenting an estimate of £580,297 for the Island's Health Services in Tynwald, the Isle of Man legislature, recently, Mr. T. C. COWIN, chairman of the Health Services Board, drew attention to the rising cost of pharmaceutical services—£65,000 in the current year.

A committee had been set up to investigate prescriptions under the chairmanship of Dr. H. H. Corrigal. It would be about 12 months before the board would receive its findings.

Last year 306,409 prescriptions were dispensed and £60,655 was paid to chemists. The average cost per prescription was 4s. 3¼d., compared with a little over 11d. in 1941. Dental treatment cost £37,635 for 13,341 completed cases and £13,326 was paid to opticians.

The sixpenny charge for each prescription form had resulted in a saving of £5,188 last year, though exemptions were given to 10,011 persons, about 20% of the population. The amount recoverable for dental treatment was £3,011.

Doctors had asked to have applied to them the recent award in Britain regarding their remuneration since July 5, 1948. If their claim were successful Tynwald would have to be asked for additional funds.

Deemster COWLEY said that specialists should have been appointed at the salary which would be theirs in England, allowing for the difference of taxation, and it was not too late to change to that system.

Mr. H. C. KERRUISH agreed that the island was paying specialists £500 a year more than in England.

Mr. H. K. CORLETT said he was not convinced that the island's health scheme should cost so much more than in England, £10 per head of the population. The time had come, he added, for the Manx Government to bring over experts to study conditions in the island.

Tynwald approved the estimate and adopted capital expenditure by the Health Services Board totalling £64,000, of which £42,000 was for Noble's Hospital and £22,000 for Ballamona Hospital.

The ATTORNEY-GENERAL (Mr. S. J. Kneale) urged that the administration of Noble's Hospital should be taken over by the Health Services Board from the hospital management committee. He stated that in 1939 the cost of running the hospital was £16,000; this year the committee was asking for £140,000. The Board should have direct control over expenditure.

The Services

Surgeon Lieutenant-Commanders A. Daunt-Bateman, O.B.E., and W. E. Kershaw, R.N.V.R., have been awarded the R.N.V.R. decoration.

Surgeon Rear-Admiral R. W. Mussen, C.B.E., R.N., has been appointed Honorary Physician to the Queen, and Surgeon Rear-Admiral J. Hamilton, C.B.E., R.N., has been appointed Honorary Surgeon to the Queen, both from March 31, 1952.

Colonel (Honorary Brigadier) G. J. V. Crosby, C.B.E., T.D., K.H.P., has been appointed Honorary Colonel of a T.A. Unit, in succession to Major-General Sir E. M. Cowell, K.B.E., C.B., D.S.O., T.D., whose tenure has expired.

The following have been mentioned in recognition of gallant and distinguished services in Malaya during the period July 1 to December 31, 1951: Lieutenant-Colonel W. N. J. Clarke, O.B.E., Major A. O. McClay, Major (temporary) H. A. J. Reay, and Captains T. B. Boulton and T. Brearley, R.A.M.C.

Captain H. C. Stevenson, R.C.A.M.C., Medical Officer, 2 Battalion, The Royal Canadian Regiment, has been appointed M.B.E. (Military Division) in recognition of gallant and distinguished service in Korea.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 5 (No. 14) and corresponding week 1951.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	22	1	10	0	3	48	8	23	1	3
Dysentery	548	81	55	4	1	846	187	194	15	4
Encephalitis, acute	4	1	0	0	1	8	1	0	0	
Enteric fever:										
Typhoid	1	0		1	1	8	1	3	0	2
Paratyphoid	7	0		0	2(B)	27	0		0	
Food-poisoning	185	12		5		69	17		5	
Infective enteritis or diarrhoea under 2 years	—			8	67	13			10	21
Measles*	6,836	231	633	227	421	28,800	2083	593	188	164
Meningococcal infection	60	6	19	4		39	5	26	0	5
Ophthalmia neonatorum	38	2	8	0		34	3	11	0	
Pneumonia†	711	40	304	10		799	36	218	15	9
Poliomyelitis, acute:										
Paralytic	15	2	1	1	1	11	0	2	0	2
Non-paralytic	4	0				4	0			
Puerperal fever§	221	36	8	1		68	8	12	3	
Scarlet fever	1,361	93	183	17	57	843	48	139	21	36
Tuberculosis:										
Respiratory			150	38				154	25	
Non-respiratory			23	16				35	3	
Whooping-cough	3,004	134	266	95	45	4,009	247	588	33	68

DEATHS in Great Towns	1952					1951				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0		0	1	*1*	0	*0*	0	0
Dysentery	0	0		0			0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0		0		*0*	0	*0*	0	
Infective enteritis or diarrhoea under 2 years	2	0	7	0	2	*13*		*5*	1	0
Influenza	33	5	6	1	0	*49*	7	*1*	0	3
Measles		0		0	0		2	*1*	0	1
Meningococcal infection		0					0	*0*		
Pneumonia	245	33		5	3	*253*	46		16	13
Poliomyelitis, acute	2	0			0	*1*	0			0
Scarlet fever		0		0	0		0	*0*	0	0
Tuberculosis:										
Respiratory	143	20	20	5	7	*175*	25	*29*	5	11
Non-respiratory		1	5	1	1		6	*3*	0	2
Whooping-cough	2	1		0	0	*6*	0	*2*	0	1
Deaths 0–1 year	249	36	44	6	15	*304*	45	*42*	14	18
Deaths (excluding stillbirths)	6,035	923	638	116	153	*5,817*	906	*673*	161	223
LIVE BIRTHS	8,204	1256	995	258	446	*8,049*	1296	*1030*	248	416
STILLBIRTHS	184	26	25			*189*	26	*39*		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Road Accidents in February

Road casualties in February were 1,035 fewer than in February, 1951. This is the first time since last June that the monthly casualty figures have been lower than in the corresponding month of the previous year. The total for the month was 11,992, of which 304 were fatal (342 in February last year).

Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending April 5. The largest falls in the number of notifications were measles 117, whooping-cough 106, acute pneumonia 90, dysentery 44, and scarlet fever 42.

The incidence of measles showed a small decline in most areas. The largest fall was 109 in Warwickshire. The chief exceptions to a declining trend were rises in Suffolk of 83 and Middlesex of 55. The largest decline in the number of notifications of whooping-cough was 52 in Derbyshire. Only small variations were reported in the local trends of scarlet fever. There were 7 fewer notifications of diphtheria than in the preceding week; one-third of the total cases were notified in Lancashire.

The number of notifications of acute poliomyelitis increased by 5 for paralytic and by 2 for non-paralytic cases. Two cases were notified in London, Lancashire, Sussex, and Yorkshire West Riding.

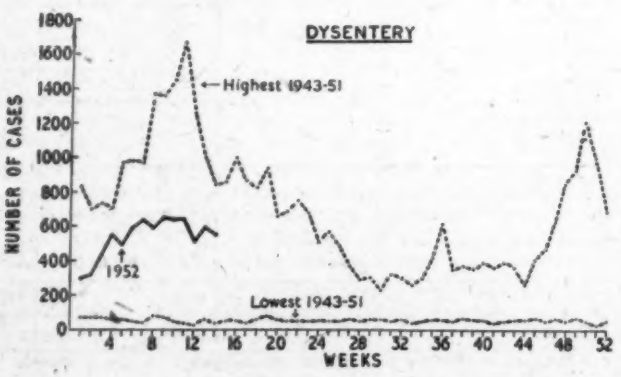
The chief feature of the returns for dysentery was a rise of 54 in Yorkshire West Riding due to an outbreak involving 41 persons in Holmfirth U.D. The other large returns were Lancashire 116 (Oldham C.B. 45, Liverpool C.B. 13, Radcliffe M.B. 11, Whitefield U.D. 10); London 81 (Poplar 18); Middlesex 56 (Enfield U.D. 28, Edmonton M.B. 13); Norfolk 34 (Norwich C.B. 22); Essex 25 (Ilford M.B. 12); Northumberland 24 (Ashington U.D. 12).

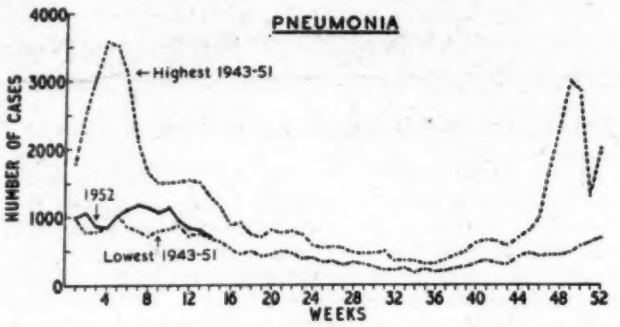
The only large outbreak of food-poisoning during the week resulted in 102 notifications in Surrey, Hambledon R.D.

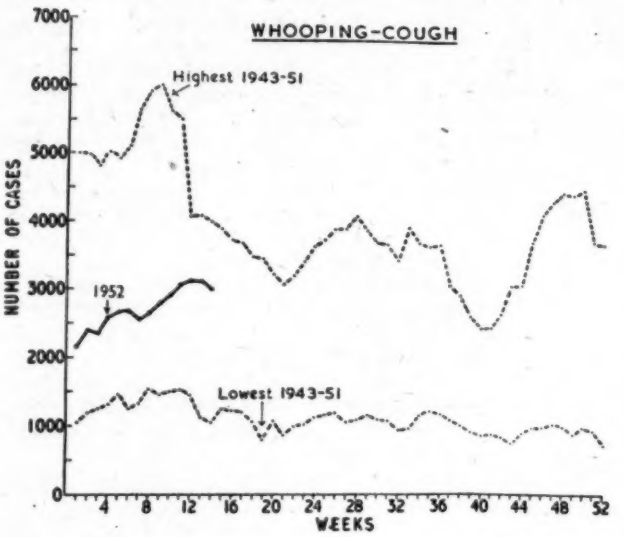
In Eire an outbreak of diarrhoea and enteritis with 58 notified cases was reported from Co. Sligo.

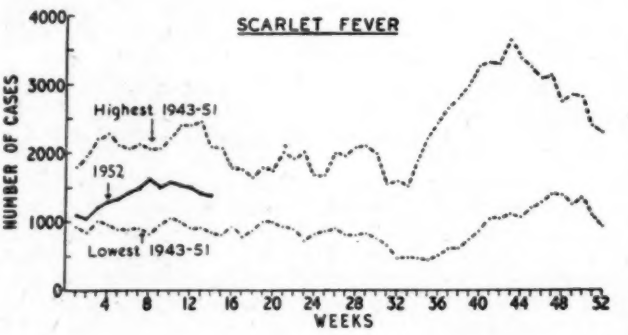
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported during the nine years 1943–51 are shown thus --------, the figures for 1952 thus ————. Except for the curves showing notifications in 1952, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Week Ending April 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,134, whooping-cough 2,306, diphtheria 24, measles 5,472, acute pneumonia 680, acute poliomyelitis 17, dysentery 489, paratyphoid fever 13, and typhoid fever 1.

Smallpox in Lancashire

In the week ending April 19 there were two notifications of smallpox in England and Wales—one at Littleborough, a district already involved, and the other at Middleton, a borough adjacent to Rochdale. This is the first case at Middleton. The man was employed in a public health department, but the source of infection has still to be determined.

For the first time in nine weeks there were no notifications from Rochdale. The case notified from Wardle U.D. (*Journal*, April 19, p. 875) was not smallpox. The total notifications in 1952 now number 138.

Medical News

Honour for Secretary of French Medical Association.—Dr. Pierre-Paul Cibrie, General Secretary of the Confédération des Syndicats Médicaux Français, has lately been promoted Commandeur de la Légion d'Honneur. Dr. Cibrie belongs to an old French family in which fathers and sons have been physicians since the seventeenth century. He was born in the south-east of France, the Périgord, well known for its deserted mountains, ruined mediaeval castles, and large forests of chestnut trees. Dr. Cibrie studied in Toulouse and Paris. In 1906 he presented his M.D. thesis on atrophy of the muscles in labour casualties, and was already interested in the social side of the question. During the 1914–18 war he received the French Military Cross and was admitted to the first grade in the Légion d'Honneur. In 1921 Dr. Cibrie was appointed Président du Syndicat des Médecins de la Seine, and in 1925 he became the head of the professional movement. Since then all his activities have been directed to the social side of medical problems, and to the possibility of retaining a human and individualistic medicine within a national public health organization. An article by him on "The French Health Service" appeared in the *Supplement*, March 15, p. 95. Dr. Cibrie refuses to be merely the head of the Confédération. He finds time for his patients, and still works as a practitioner. Last month, when he was promoted Commandeur de la Légion d'Honneur, Dr. Bernard Lafay, a senator and former Minister, and Dr. Rouèche, president of the Confédération, in two eloquent congratulatory speeches said that his energy and good judgment were the chief qualities which had helped him all through his life to become what he is and to accomplish what he has done. Dr. Cibrie, in a witty speech, answered that so numerous were those who had helped him in his work that very little was left for him to do. This ceremony took place at a small and intimate reception at 60, Boulevard de La Tour Maubourg, the headquarters of the Confédération, when a toast was drunk in his honour.

Foreign Science Students.—At a meeting held at the Society for Visiting Scientists Limited on March 19 the Overseas Science Students' Association was instituted by the adoption of rules for the association. The objects of the association are to bring graduate science students from overseas into contact with the scientific life of Great Britain and with other students. It is affiliated to the Society for Visiting Scientists, where its meetings will be held. About 100 overseas science students have already joined the association. Further applications are invited and should be addressed to the secretary, Mr. P. Sen, care of the Society for Visiting Scientists Limited, 5, Old Burlington Street, London, W.1.

Enderlein's Laboratory Closed.—According to the *Münchener Medizinische Wochenschrift* (April 11, 1952, p. 759) the West Berlin Regional Health Board has ordered the closing of the Immunobiological Institute conducted by Dr. Günter Enderlein—a non-medical man—because methods of production of sera and vaccines at the Institute do not satisfy the rules laid down by the Board. It is stated that Dr. Enderlein has refused independent clinical trials of his products. His institute has introduced a cancer cure and a serum for the treatment of Hodgkin's disease which earlier this year was the subject of press reports in this country.

Professor Alan Moncrieff has just been elected a *correspondant étranger* of the Académie Nationale de Médecine, Paris.

N.A.P.T. Clinical Conference.—A clinical conference on the value of surgery and antibiotics will be held in Perth, Scotland, on October 3 and 4. It will be open to all doctors, and full particulars may be obtained from Miss A. J. Weir, N.A.P.T., Castle Street, Edinburgh, 2.

Medical Art Society's Annual Show.—This exhibition opened at Walker's Galleries in Bond Street on Monday, April 21, and continues for a fortnight. There are 167 paintings, roughly two-thirds of which are in oils, and several well-known London consultants are among the exhibitors. The majority of works, as is to be expected, are landscape records of happy holidays, often painted with considerable accomplishment, but there are also about half a dozen portraits. Several artists have not been content with simple recording and have experimented with semi-surrealist treatments, or have let their imaginations have free rein, sometimes with very pleasing results, as in the satirical *The Toilet*, No. 149. This is certainly a show to be supported.

New M.R.C. Unit.—In agreement with the University of Birmingham the Medical Research Council has established a unit for research on the experimental pathology of the skin under the direction of Professor J. R. Squire at the Department of Experimental Pathology, The Medical School, Birmingham, 15. The council's unit at the Birmingham Accident Hospital will now be known as the Industrial Injuries and Burns Research Unit and will be directed by Dr. J. P. Bull, who was formerly the assistant director.

Awards for Study in America.—Of 22 Commonwealth Fund Fellowships to be held for a year in American universities by British graduates five are for medical and allied subjects. Two are for medicine, and have been given to D. F. Gibbs, of Edinburgh, and R. B. Thompson, of Newcastle-upon-Tyne. I. E. Bush, of Cambridge, is awarded a Fellowship in biochemistry, H. E. Huxley, also from Cambridge, one in biophysics, and N. A. Mitchison, who graduated at Oxford, will study genetics.

Emergency Bed Service: Applications and Admissions.—During the seven days ending April 21 the number of applications made by doctors to the London Emergency Bed Service for admission of patients was 970, of whom 91.63% were admitted.

COMING EVENTS

Contraceptive Technique.—Dr. Marie Stopes will be giving a lecture on contraception together with a demonstration on living models on Thursdays, May 1, June 5, and July 3. Lectures are at 2.30 p.m., no fee is charged, but tickets must be obtained beforehand from the Mothers' Clinic, 106 and 108, Whitfield Street, London, W.1.

Medical Association for the Prevention of War.—A conference open to all doctors is being held at the Royal College of Surgeons (Lincoln's Inn Fields, W.C.2) on May 10 at 2.30 p.m. and May 11 at 10.30 a.m. to discuss "Biological Warfare," "The Psychology of War Preparation," "International Medical Services," and "The Hippocratic Oath and the Declaration of Geneva." Tickets are obtainable from Dr. Arnold Klopper, 24, Lansdowne Road, London, W.11.

Nutrition Society.—The annual general meeting will be held on May 15, at 2.30 p.m., in the Linnean Society Rooms (Burlington House, W.1). The scientific meeting will follow an hour later, and a dinner will be held at the Trafalgar Restaurant, Northumberland Avenue, at 7 p.m. for 7.15 p.m. Full details from Dr. G. H. Bourne, London Hospital Medical College, E.1.

Aiding Victoria Medical Foundation.—The Kingston and Malden Victoria Medical Foundation was founded to provide a new voluntary hospital to replace that annexed by the Kingston County Hospital under the N.H.S. last year. In it patients will once again be able to be treated by their family doctors. On May 14 at 7.30 p.m. at the Scala Theatre, Charlotte Street, London, W.1 (Tel. Mus. 5731), the Stock Exchange Dramatic Society is presenting "Miranda," by Peter Blackmore, in aid of the Foundation's funds.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, April 25

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.15 p.m., *"Surgery of Repair,"* by Mr. R. J. V. Battle; 6.30 p.m., *"Tumours of the Jaws,"* by Mr. S. H. Wass.

Sunday, April 27

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Adolph Tuck Hall, Woburn House, Upper Woburn Place, W.C., 3 p.m., *"Genetics in Medicine—Problems and Prospects,"* by Professor Arnold Sorsby.

Monday, April 28

INSTITUTE OF DENTAL SURGERY, Gray's Inn Road, London, W.C.—5 p.m., *"Periodontitis and Gingivitis as Sources of Headache and Other Head Pain,"* by Dr. Frode Hilming (Copenhagen).

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, Denmark Hill, London, S.E.—5.30 p.m., lecture-demonstration for postgraduates by Dr. E. Stengel.

MANCHESTER MEDICAL SOCIETY.—(1) At Lecture Room, Dental Hospital, 5 p.m., meeting of Section of Odontology. A.G.M. followed by clinical meeting. (2) At Manchester Royal Infirmary, 9 p.m., meeting of Section of General Practice. Film: *"The Treatment of Heart Failure,"* commentary by Dr. A. Morgan Jones.

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, W.—8.30 p.m., *"Treatment of Tuberculosis of Urinary Tract,"* discussion to be introduced by Mr. W. W. Galbraith and Mr. J. G. Yates Bell.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.15 p.m., *"Lymphoedema of the Lower Extremities,"* by Professor A. M. Boyd; 6.30 p.m., *"Ureteric Obstruction,"* by Professor V. W. Dix.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—5 p.m., *"Clinical Aspects of Accommodation. Treatment of the Hypermetrope,"* by Dr. T. H. Whittington.

UNIVERSITY COLLEGE, LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 4.45 p.m., *"Chemical Structure, Interaction, and Fractionation of Proteins,"* public lecture by Professor J. T. Edsall (Harvard).

Tuesday, April 29

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.15 p.m., *"Clinical Aspects of Peripheral Vascular Disease,"* by Professor Ian Aird; 6.30 p.m., *"Cleft Lip and Palate,"* by Professor T. Pomfret Kilner.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—5 p.m., *"Genetics in Ophthalmology,"* by Professor Arnold Sorsby.

UNIVERSITY COLLEGE, LONDON.—At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., *"The Development of Perception and Thought,"* special university lecture in psychology by Professor D. O. Hebb, Ph.D. (McGill University). (See also April 30 and May 2.)

Wednesday, April 30

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 8.15 p.m., clinical meeting.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Shenley Hospital, near St. Albans, Hertfordshire, 3 p.m., general meeting. Demonstration of cases. Introductory talk on psycho-analysis by Dr. S. T. Hayward. A discussion will follow.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.45 p.m., *"Abdominal Emergencies in Childhood,"* by Mr. Harold C. Edwards.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—5.30 p.m., "Proptosis," by Mr. L. H. Savin.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—3.30 p.m., "Radiology and its Contribution to the Diagnosis of Abdominal Disease" (Illustrated), by Dr. S. Cochrane Shanks.

UNIVERSITY COLLEGE, LONDON.—At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., *"The Development of Perception and Thought,"* special university lecture in psychology by Professor D. O. Hebb, Ph.D. (McGill University). (See also April 29 and May 2.)

Thursday, May 1

DURHAM UNIVERSITY.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, 5.15 p.m., *"Haematuria,"* 11th Rutherford Morison Lecture by Dr. E. N. Cook.

EDINBURGH UNIVERSITY, University New Buildings, Teviot Place.—At Anatomy Theatre, 5 p.m., *"The Treatment of Dorso-lumbar Fractures of the Spine with Paraplegia,"* Honyman Gillespie Lecture by Mr. I. A. G. Lawson Dick.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, Great Ormond Street, London, W.C., 5 p.m., *"Report on a Scheme for Collecting Homoeopathic Case-Records,"* by Dr. N. J. Pratt.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY, The Union, University Avenue, Glasgow.—7.30 p.m., annual general meeting.

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—5.30 p.m., *"Disinfection and Sterilization,"* by Dr. J. O. Oliver.

●MOTHERS' CLINIC, 108, Whitfield Street, London, W.—2.30 p.m., lecture and demonstration (on living models) on contraceptive technique by Marie C. Stopes.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.30 p.m., *"The Histopathology of Sinusitis,"* by Dr. H. A. Lucas.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—5.30 p.m., *"Surgery of Squint,"* by Miss J. M. Dollar.

ROYAL SOCIETY, Burlington House, Piccadilly, London, W.—10.30 a.m., *"The Structure of Proteins,"* discussion to be opened by Professor W. T. Astbury, Sc.D., F.R.S.

ST. ANDREWS UNIVERSITY.—At Materia Medica Department, Medical School, Small's Wynd, Dundee, 5 p.m., *"The Pathological Physiology of Dyspnoea,"* by Professor D. Whitteridge.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—5 p.m., lecture-demonstration in neurology by Dr. D. Williams.

WEST END HOSPITAL FOR NERVOUS DISEASES.—At 48, Cosway Street, Marylebone Road, London, N.W., 5.30 p.m., *"Physical Methods of Treatment. II"* (Demonstration), by Dr. E. H. Larkin.

Friday, May 2

●INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—5.30 p.m., *"The Handling of the Common Dermatoses,"* clinical demonstration by Dr. R. M. B. MacKenna.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, London, W.C.—5 p.m., *"The Technique of Illustrating Medical Papers and Lectures,"* Guest Lecture by Dr. R. Ollerenshaw.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—5.15 p.m., *"Indications for Radiotherapy,"* by Professor B. W. Windeyer; 6.30 p.m., *"Surgery of Repair—Skin Grafting,"* by Sir Archibald McIndoe.

ROYAL EYE HOSPITAL, St. George's Circus, Southwark, London, S.E.—5.30 p.m., *"The Physiology of A.C.T.H. and Cortisone with Special Reference to the Eye,"* by Dr. C. A. Keele.

UNIVERSITY COLLEGE, LONDON.—At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., *"The Development of Perception and Thought,"* special university lecture in psychology by Professor D. O. Hebb, Ph.D. (McGill University). (See also April 29 and 30.)

Saturday, May 3

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, London, W.C.—11.30 a.m., *"Physiology and Pathology of the Soft Palate,"* with film on a plastic operation for open rhinophonia, by Professor S. Podvinec (Zagreb).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bailey.—On March 22, 1952, at Providence Hospital, Moose Jaw, Saskatchewan, Canada, to Olive May, wife of Dr. Norman Loudon Bailey, a daughter—Heather Jane.

Hall.—On April 13, 1952, to Mardi, wife of Dr. Derek W. Hall, of 5, Pencester Road, Dover, a daughter.

MARRIAGES

Laidlaw—Mair.—On April 2, 1952, at Port Glasgow, Allan James Laidlaw, L.R.C.P.&S.Ed., L.R.F.P.S., Barbourne Road, Worcester, to Greta MacAskill Mair, S.R.N., Port Glasgow.

Owen—Hughes.—On March 20, 1952, at Garth Chapel, Portmadoc, Arthur Wyn Owen to Dr. Gwen Ellis Hughes.

DEATHS

Allen.—On April 18, 1952, Robert Hugh Allen, M.D., late of Forest Gate, London, E., and Potters Bar, Middlesex, aged 85.

Candlish.—On April 13, 1952, at his home, 9, Learmonth Gardens, Edinburgh, Eric Elsmore Candlish, M.B., Ch.B., formerly of Southfield, Linlithgow, aged 57.

Chennell.—On April 16, 1952, Eileen Annie Chennell, M.B., B.S., D.P.M., of London, S.W.

Deas.—On April 17, 1952, at 20, Milton Road, Bournemouth, Hants, Leonard Joseph Montagu Deas, M.B., F.R.C.S.Ed., Colonel, I.M.S., retired, aged 78.

Fleming.—On April 10, 1952, at a nursing home, Glasgow, Geoffrey Balmanno Fleming, M.B.E., M.D., LL.D., F.R.C.P., F.R.F.P.S., aged 70.

Gordon-Wilson.—On April 13, 1952, Alexander Gordon Gordon-Wilson, M.D., F.R.C.S., of 51, Queen's Gate Gardens, London, S.W.

Hare.—On April 16, 1952, John Hare, O.B.E., M.D., F.R.F.P.S., D.L.O., Lieutenant-Colonel, R.A.M.C., retired, of 7, Culford Gardens, Chelsea, London, S.W.

Hosford.—On April 10, 1952, at Seafield Nursing Home, Bexhill-on-Sea, John Stroud Hosford, F.R.C.S.Ed., of 37, Harley Street, London, W., and Bexhill-on-Sea, Sussex.

Howard-Jones.—On April 12, 1952, at Torrington, Caerau Road, Newport, Mon., John Howard-Jones, T.D., M.D., D.Sc.

Johnson.—On April 12, 1952, at 11, Chadwick Road, Westcliff-on-Sea, Essex, Henry Johnson, L.S.A., F.F.A. R.C.S.

Ledgard.—On April 11, 1952, at Windsor, Herbert Arthur Ledgard, M.B., Ch.B., Surgeon Lieutenant-Colonel, Royal Horse Guards.

Martin.—On April 8, 1952, at The Firs, Rhayader, Radnorshire, Charles Martin, M.B., C.M., aged 83.

Mole.—On April 10, 1952, Richard Howard Mole, M.D., of 60a, Higher Bebington Road, Bebington, Cheshire, formerly of Moukden, Manchuria, aged 75.

Oliver.—On April 10, 1952, at Magdalen Hill, Winchester, Hants, Leonard William Oliver, M.R.C.S., L.R.C.P., formerly of Hillside, Ropley, aged 84.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Prolonged Administration of Mercurial Diuretics

Q.—*In view of the reported incidence of renal lesions in children following the prolonged administration of teething powders containing mercury ("British Medical Journal," February 16, p. 358), are mercurial diuretics contraindicated in the treatment of cardiac oedema if there is also renal insufficiency?*

A.—Mercurial diuretics should be used with caution in cases of heart failure complicated by renal insufficiency, but should not be withheld. A good diuresis reduces the blood volume and thus lowers the venous pressure. This improves cardiac function and hence the renal blood flow. Only prolonged administration of mersalyl (usually over a period of years) may damage the kidneys; relatively short-term therapy is nearly always safe, even in cases of chronic nephritis. The chief danger to renal function is excessive salt depletion, which may result from a combination of mersalyl and a rigid low-sodium diet (0.5 g. daily). Hiccups, abdominal cramps, and general weakness usually indicate this development.

Antabuse Therapy

Q.—*What are the indications for and against "antabuse" (tetraethylthiuramdisulphide) in alcoholism? How is it administered?*

A.—Before beginning treatment it is essential to have the patient under strict observation, which will generally be in hospital. One tablet of antabuse (containing 0.5 g. tetraethylthiuramdisulphide) is given, and about an hour later a dose of the favourite alcoholic drink. For instance, if this be gin a dose of half an ounce (14 ml.) could be given. The combination of antabuse and alcohol causes fluctuations of blood pressure, which are felt by the patient as a flushing of the head and neck and a feeling of constriction in the chest; there may also be a sensation of imminence of fainting. With a small dose of alcohol the sensations, though uncomfortable, will not be dangerous. The feeling passes off in one-half to two hours, but while it is at all marked the patient should be watched and one or two pulse- and blood-pressure observations should be made. On the next and succeeding days the dose of alcohol is gradually increased to the limit of tolerance. The purpose of the treatment is to inspire the patient with a disgust for his favourite beverage (or for alcohol in all forms), and therefore it is well to accompany the administration of the drug with an energetic though simple psychotherapy.

After this "deconditioning" method of treatment has been applied the patient may be allowed to return home to ordinary life, on the understanding that from now on he is to be teetotal. Without this understanding, the treatment is of no avail and only represents a danger. For a short time the daily tablet of antabuse is continued, but shortly reduced to half a tablet and later to a quarter. The presence of antabuse in the system will provide the patient with warning sensations, of a kind he has learned to fear and detest, if he does take a drink.

A few deaths have been reported from the United States. These have largely occurred after the initial hospital treatment, when the patient, despite his daily regimen, has had a drink or two and, ignoring the warning sensations, gone on into a regular bout. The toxic effects depend as much on the dose of alcohol taken as on the dose of antabuse. The deaths were due to circulatory failure. The main physical contraindications appertain to the vascular system—for example, myocardial disease, severe hypertension, etc. The psychiatric contraindications are lack of the will to be cured, lack of determination to remain teetotal—there must be a willing spirit though the flesh be weak—total unreliability of personality by which good intentions, however sincere, are easily forgotten, and also some forms of compulsive drinking where the impulse to drink, once formed, will prove overmastering.

Surveillance of Lead Workers

Q.—*What are the best tests for the surveillance of workers exposed to the risk of lead poisoning? How often should the tests be performed, and how should they be interpreted? Is there a satisfactory quantitative test for lead in the urine?*

A.—The best tests for surveillance of workers exposed to risk of lead absorption are: (1) Routine counting of punctate basophils and haemoglobin estimations; (2) lead-in-air estimations. Lead-in-air estimations should be carried out at least yearly, or more frequently if there is liable to be any fluctuation in amount due to changes in processes or working conditions. The generally accepted safe limit is 1.5 mg. of lead per 10 cubic metres of air. If the lead-in-air is well below the safe limit, punctate basophil counting can be done once a year. When lead-in-air estimations show around 1.5 mg. or over, punctate counts and haemoglobin estimations should be carried out three to four times a year.

Interpretation of punctate counting varies with the method employed. The most reliable method is by dark-ground illumination of a thin film stained with alkaline methylene blue. The mean count of a group of lead workers should then be kept below 1,500 punctate basophils per million red cells. When dealing with individuals, one should remember that there are various other causes of punctate basophilia and that counts in a normal person not exposed to lead may, by dark-ground methods, be as high as 5,000 per million red cells. A rising count going from 8,000 to 10,000 with a falling haemoglobin should lead to suspension from lead work.

Lead-in-urine estimations are usually carried out by colorimetric methods, with dithizone as a reagent. Two principal methods are described: (1) Wet ashing methods (*Biochem. J.*, 1940, **34**, 1245; *Industr. Engng Chem.*, 1942, Analytical Ed., **14**, 904); (2) a rapid screening method (*J. industr. Hyg.*, 1948, **30**, 59). These methods require a skilled analyst with adequate experience of the processes, if the results are to be of any practical value.

Rabies Control

Q.—*Recently an outbreak of rabies has occurred in this district (Hong Kong). All dogs have been inoculated against rabies, which I believe carries 100% immunity. However, I am not sure what effect the inoculation has (a) on dogs which have previously been infected by rabies but which have not yet developed symptoms, and (b) on dogs which are bitten by a rabid animal during the month following the inoculation—that is, before the dog has developed complete immunity.*

A.—It cannot be assumed that the inoculation of dogs with anti-rabic vaccine will confer 100% protection, though with multiple injections of large doses of concentrated suspension a high level of immunity can be expected. This takes from two to three weeks to develop after inoculation. The answers to both (*a*) and (*b*) are determined by the same factor. If the artificial immunity has had time to develop before symptoms from the natural infection appear, then protection will be conferred. As the incubation period of naturally acquired rabies in the dog is very variable it is impossible to predict in any one case whether the artificial immunity will develop in time or not: on the other hand, if three weeks elapse after inoculation without symptoms of rabies, the chances of the animal escaping are good, depending on the efficiency of the immunization.

Night Sweats

Q.—*A middle-aged woman suffers from severe and persistent night sweats. What is the likely cause? How should she be investigated and treated?*

A.—Night sweats in their true form usually indicate pyrexia and thus require the type of detailed investigation that is planned in a case of pyrexia of uncertain origin. Tuberculosis will, of course, come to mind straight away, but bacterial endocarditis, rheumatoid arthritis, neoplasia, and the reticuloses all can present as night sweats. Occasionally menopausal women describe flushes as night sweats, and then they are relieved by oestrogens. There are some patients with vasomotor instability associated with anxiety states who have night sweats without any apparent cause or accompanying fever. These are few in number compared with the infective, toxic, or neoplastic groups, and the diagnosis should not be made until a thorough investigation has been undertaken.

Treatment depends on the condition, and symptomatic treatment is rarely helpful. Belladonna is given traditionally, but only infrequently gives relief.

Thrombocytopenic Purpura and Pregnancy

Q.—*Is a past history of thrombocytopenic purpura a contraindication to pregnancy? Three years ago a woman of 30 had this condition (platelets 60,000 per c.mm.; bleeding time 42 minutes, control 2½ minutes; clotting time 8 minutes, control 5 minutes; otherwise the blood count was normal). At that time she had marked purpura and some bleeding from her mouth and vagina, but she settled down without treatment; ten months later she had a minor recurrence. She had a normal pregnancy and confinement a year before her purpura, and wants to have a second baby. She has now been well for two years, and her present platelet count is 130,000 per c.mm.*

A.—Under the circumstances a further pregnancy is not contraindicated, provided the woman is in close contact with an efficient hospital where emergency blood transfusions can be given should a further haemorrhagic tendency manifest itself during the pregnancy. This would seem to be a case in which splenectomy should be seriously considered, especially if any further difficulty arises.

Medicine and Modern Life

Q.—*From time to time I am asked by lay acquaintances what are the main contributions of modern medicine to present-day living. It is easy enough to give a superficial answer to this, but far more difficult when pressed for details by an intelligent but sceptical questioner. Where can I find a short authoritative survey of recent progress in the various fields of medicine?*

A.—In *Fifty Years of Medicine*, a symposium first printed in the *British Medical Journal* and later issued as a book. The book, which is attractively illustrated, may be obtained from the Publications Manager, B.M.A. House, Tavistock Square, W.C.1, for 15s. (including postage).

Cod-liver Oil Stains

Q.—*What is the best way of removing cod-liver oil stains from mackintoshes, suits, and woollen clothes?*

A.—Cod-liver oil is readily soluble in chloroform, and this solvent could be used for fresh superficial stains on mackintoshes. Since this solvent would attack rubber, however, any marked stains should be treated by a thorough rubbing with undiluted liquor sulphestolis *B.P.C.*, followed by thorough washing. This process may have to be repeated several times.

Suits should be treated by wiping the stained area several times with a sponge or cloth thoroughly soaked in chloroform. The area could later be treated with undiluted liquor sulphestolis, followed by sponging with water.

Woollen clothes could be treated by soaking the stained area in chloroform, followed by thorough washing in a solution of liquor sulphestolis, diluted about 1 in 20. If the stain is very persistent it should be thoroughly rubbed with chloroform, followed by undiluted liquor sulphestolis and washing. Since the odour of cod-liver oil is very persistent, it may be advisable to add a little suitable perfume to the chloroform or liquor sulphestolis.

NOTES AND COMMENTS

Physical Characters Associated with Schizophrenia.—Dr. E. ZIMMERLI (Basle) writes: In "Any Questions?" (March 8, p. 558) the question is asked: "With what physical characteristics is a tendency to schizophrenic illness genetically associated?" The answer given seems to me incomplete in two respects. First, the old question of a possible connexion between schizophrenia and tuberculosis is again raised, and your reply leads one to suppose that the evidence for and against the existence of such a link is about equal. As both diseases are relatively common and are therefore bound not infrequently to be met with in one and the same person, and also as any *a priori* likelihood of a connexion between the two is remote, it seems fair to lay the onus of proving such a connexion upon the one who asserts it. One of the latest papers on the subject was published in 1949 by B. A. Zurgilgen, a pupil of M. Bleuler, of Zurich. By means of careful statistical analysis, he confirmed what M. Bleuler had established 10 years before—namely, that no abnormal incidence of tuberculosis among schizophrenics and their families exists. According to Zurgilgen, the erroneous belief in a connexion between the two is partly due to a confusion of certain traits of neuroses commonly observed in chronic tuberculous patients with the genetic schizoid constitution (*Schweiz. med. Wschr.*, 1949, 79, 75). Secondly, it seems a pity not to mention in this connexion the valuable work of E. Kretschmer, who made such a fundamental contribution to the question of the physical characteristics of the schizoid constitution, of which the schizophrenic is but a pathological variant. I am prompted to write these lines by the feeling that Kretschmer's work, though dating back to 1921, has still not found the recognition it deserves in the English and American literature. The reason is easy to see, but none the less regrettable. Kretschmer's small book *Körperbau und Charakter*, written in a simple and lucid style, is based on measurements of the patients of an asylum. It succeeds in establishing a connexion between certain definite types of build and schizophrenia (as well as that of another type met with in manic-depressive psychosis). Another part of the book puts these deductions to the test by applying them to well-known figures of the past; these are mostly German writers, who naturally do not represent such convincing illustrations for the English reader. So far as I am aware, no English version of the book has been attempted, and certainly it would require an adaptation far beyond mere translation in the ordinary sense. But, to revert to the original question, I would humbly suggest that the answer is: The schizoid constitution is genetically associated with certain types, as described by Kretschmer. Whether a healthy person of schizoid constitution ever develops schizophrenic illness or not is, of course, quite another matter.

OUR EXPERT writes: I cannot agree that the possible association between schizophrenia and tuberculosis has been finally settled in a negative sense; it is still to be regarded as *sub judice*. The association is not without *a priori* probability; Kallmann's theory of the genetics of schizophrenia envisages a *locus minoris resistentiae* in the reticulo-endothelial system which could be common to both conditions. This is not to say that the researches of Bleuler and Zurgilgen do not throw doubt on the existence of any connexion. The work of Kretschmer and his pupils on physical habitus and its relation to the psychoses is, of course, well known and much appreciated in this country. Although the association between the pyknic habitus and manic-depressive disorders is much more widely accepted than the association between leptosome habitus and schizophrenia, Kretschmer's work should have been referred to in answer to the original question.

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